Independent Consumer Guides to Document Imaging Equipment

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THE COLOR LASER PRINTER & BUSINESS INK JET PRINTER GUIDES

Xerox Phaser 7760

- *Color laser-class printers for the office from $499*
- *Color ink jet printers for the office from $99*
- *Updated for 2007*
- *Editor's Choice Awards*

Guide Number: 188

Better Buys for Business

The Color Laser Printer Guide

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EDITOR'S CHOICE AWARDS

From the nation's leading independent authority on office equipment

About the Award

What is an Editor's Choice Award?

This award signifies the best values in each product category, as determined independently by our expert editorial staff.

How often are awards given?

Our Editor's Choice ratings are awarded once per year with each updated guide.

What are the selection criteria?

In each Better Buys guide, we evaluate models from all major manufacturers. Machines are rigorously analyzed to determine (1) the strength of their features and specifications and (2) how they stack up against competitors. Our independent Editor's Choice Awards go to those models that we believe will deliver the highest levels of performance and offer the greatest value for consumers in a given price range.

What categories are judged?

There are four awards categories: economy models, workgroup models/letter-size (priced under $1,000), workgroup models/letter-size (priced over $1,000), and workgroup models/ledger-size.

Where can I find information about each brand and model?

The page references at the right show where to turn for write-ups in the Vendor & Product Profiles section and for entries in the Specification & Price charts. For example, "Ricoh Aficio CL3500N — pages 36 & 106" means that the product profile appears on page 36 and the specifications and price appear on page 106. The models in parentheses are relabeled versions of the ones immediately above them and share our Editor's Choice rating.

Look for the Editor's Choice emblem inside the guide.

Editor's Choice Award Winners

COLOR LASER PRINTER

Economy Models/Letter-size ($499 and under)

Lexmark C530/C532 family — pages 26 and 94–96
OKI Printing Solutions C3400n — pages 31 and 100
Ricoh GX3000/GX3050N/GX5050N — pages 39 and 109
Samsung CLP-600N — pages 43 and 113

Workgroup Models/Letter-size ($500 to $999)

Lexmark C534 family — pages 26 and 94–96
OKI Printing Solutions C5500n/C5800Ldn — pages 31 and 100
Ricoh Aficio CL3500N — pages 37 and 106
(Gestetner C7521n — pages 7 and 72)
(Lanier LP222cn — pages 24 and 92)
(Savin CLP22 — pages 44 and 114)
Samsung CLP-650N — pages 43 and 113

Workgroup Models/Letter-size ($1,000 and over)

Hewlett-Packard Color LaserJet 4700 family — pages 12 and 79–80
Kyocera FS-C5015N/FS-C5025N — pages 21 and 89–90
Lexmark C770/C772 family — pages 27 and 96–97
(IBM Infoprint Color 1654 family — pages 16 and 84)
(IBM Infoprint Color 1664 family — pages 16 and 84–85)
(Unisys UDS 579-DN1 — pages 48 and 118)

Workgroup Models/Ledger-size

Hewlett-Packard Color LaserJet 5550 family — pages 14 and 81–82
Lexmark C920 family — pages 29 and 98–99
(IBM Infoprint Color 1567 — pages 16 and 85)
(Toshiba e-STUDIO360 CP — pages 48 and 117)
Konica Minolta magicolor 7450 — pages 19 and 88
Ricoh Aficio CL7200 — pages 39 and 107–108
(Gestetner C7528n/nD — pages 7 and 72–73)
(Lanier LP332cdn/cdtn — pages 25 and 93)
(Savin CLP128 — pages 44 and 114)
Xerox Phaser 7760 family — pages 55 and 124

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Vendor & Product Profiles

This section provides an overview on each vendor (complete with contact details) followed by analysis on each model offered for sale in the color laser printer market. General information about the market, including discussions of technology as well as advice on how to buy a color laser printer, follows this section.

Buying Tips
Color Laser Printers

- ✔ Resolution is not an issue for the majority of offices; it should not determine your choice.
- ✔ Take monthly duty cycles with a grain of salt. Use them for comparison purposes only, but don't expect to get the full page count month in and month out.
- ✔ The street price of a printer is usually in inverse proportion to the price of toner. The cheaper the machine, the more expensive per page.
- ✔ Cost per page is based on an industry standard coverage of 5%. If you use lots of graphics, shaded boxes, and/or small type, your costs will be higher.
- ✔ List prices are what the dealer starts negotiating with; you should be able to settle for one-third off that price.
- ✔ PostScript is a must if you use Illustration or page layout programs. For other office uses, PCL or host-based printing is fine.
- ✔ Extra memory is a big plus if you use PostScript; good if you run multipage and multicopy jobs (electronic collation); it adds nothing to host-based printing.
- ✔ Most users don't need hard disks on their printers. An exception is for high-security printing, often-used forms, or truly enormous electronically collated jobs.
- ✔ It's great to have thousands of pages of input, but not if you have only a 250-sheet exit tray.
- ✔ Toner saver and automatic duplexing can be money savers — but only if you get people to use them.

BROTHER

Bridgewater, NJ
908 704 1700
www.brother.com

Vendor Profile

Brother International — the US subsidiary of Brother Industries, Ltd., of Nagoya, Japan — has created a reputation for value by selling low-cost small- and home-office-oriented equipment. A solid presence in the monochrome laser printer market, the company has been trying to make its way into the color market.

The company's color models are respectable, but breakthrough offerings from other vendors mean that Brother has to play catch-up to stay viable in this market.

Brother sells its color laser printers through the traditional two-tiered computer equipment channel: national distributors and value-added resellers (VARs). While Brother makes its own engines for most of the laser products it sells — including monochrome printers, faxes, and multifunctional machines — it uses other companies' engines in its two current color laser products.

Product Profiles

Brother HL-2700CN

8ppm full color
31ppm black & white

Sum-up: A good bargain with strong standard features.

The HL-2700CN can print up to 8ppm in color and 31ppm in black-and-white. That's acceptable for a printer that costs $500. It is notable that the HL-2700CN is Ethernet-ready (the CN suffix stands for "Color, Networked") and offers PostScript 3 (as well as PCL 6)

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standard. These features are sometimes costly add-ons to otherwise inexpensive color printers — in a few cases, they are simply not available. Like many network-enabled printers these days, the HL-2700CN has an embedded Web server that allows for remote administration.

On the other hand, an automatic duplex unit is available as an option, but at $999 list, it is no bargain. Instead of a hard drive, you can use CompactFlash cards in a built-in slot, which gives you a little extra memory for handling some of the software extras outlined below. The HL-2700CN starts with 64MB of memory but can be extended to a quite good 576MB. The standard paper supply is based on a 250-sheet paper tray, and you can add another 530-sheet paper tray for $549, list.

Brother includes some nice software features, especially for an economy model. The machine has secure print capability, so that you can send jobs and have them held at the printer until you enter a password. This helps keep sensitive material away from prying eyes. It also allows you to reprint the last job without reprocessing the print data, a handy time-saver when there is a paper jam or the toner has run out in the middle of your job. You can store frequently run jobs (like forms) and print them directly from the printer. There's also a stop job button on the unit. Toner-saver mode is available as well.

The engine images at 600dpi resolution and supports up to 2,400dpi through image enhancement, a respectable number in the "highest-dpi" resolution game in which many vendors engage.

Costs per page are around 3.5¢ per black-and-white page (well above average) and 14.3¢ for color (also above average), but these are list prices. You can get a better deal on supplies if you look.

The 8ppm color speed looks rather slow compared with the latest generation of single-pass printers that print at 16–28ppm. However, the black printing speed of 31ppm is excellent.

One big competitor of this printer is the Lexmark C532n, which also is Ethernet-ready and has PostScript standard.

You might also want to take a look at the OKI Printing Solutions C5500n, which sells for $599, and is faster in color at 20ppm (24ppm in black-and-white). That printer lacks PostScript, which may or may not be important for your office.

If you were going to crank out color pages all day long, you probably wouldn't consider this model. But for the small office or workgroup that has a mix of color pages and a steady stream of black-and-white work, this is a solid choice.

Chart entry — page 70

Brother HL-2700CN
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$173.99	10,000	$0.017	$0.017
Cyan toner	$178.99	6,600	$0.027	N/A
Magenta toner	$178.99	6,600	$0.027	N/A
Yellow toner	$178.99	6,600	$0.027	N/A
OPC belt/black	$503.99	60,000	N/A	$0.008
OPC belt/4-color	$503.99	15,000	$0.034	N/A
Waste toner bottle	$12.99	12,000	$0.001	$0.001
Fuser unit	$577.99	60,000	$0.010	$0.010
TOTAL PER-PAGE COSTS			$0.1431	$0.0365
			14.31	3.65

Brother HL-4200CN

26ppm full color
26ppm black & white

Sum-up: Good features and speed, but the price is too high.

This color printer offers both 1,200dpi resolution and 26ppm speed in color and black-and-white. The model's street price is $1,300.

Among the HL-4200CN's features are 64MB of standard memory (expandable to 320MB) and an optional 20GB hard drive — an important option for a color printer that may be called upon to handle complex files and make collated sets. Note that when you print in color at 1,200dpi, you take a speed hit down to 13ppm. However, 600dpi is sufficient for most color jobs.

What's also noteworthy about this printer are the standard features that sometimes are extras on other models. Ethernet comes standard, a big plus, as does PostScript 3. Finally, automatic duplex is included in the basic package as well.

The standard paper capacity starts at 600 sheets, and the maximum capacity is 2,100 sheets. A 400MHz controller and up to 320MB memory capacity ensure consistent machine performance. Brother also touts its highly interactive control panel, with excellent animated help features. The printer is rated for a solid monthly duty cycle of 60,000 pages.

Per-page operating costs are a mixed bag. A black-and-white page costs around 2.5¢ to print, which is no bargain. The color page cost is around 10.4¢, near average.

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Brother HL-4200CN Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$62.99	9,000	$ 0.007	$ 0.007
Cyan toner	$157.99	6,000	$ 0.026	N/A
Magenta toner	$157.99	6,000	$ 0.026	N/A
Yellow toner	$157.99	6,000	$ 0.026	N/A
Print head cartridge	$419.99	30,000	$ 0.014	$ 0.014
Transfer Roller	$57.99	25,000	$ 0.002	$ 0.002
Fuser unit	$241.99	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1047	$ 0.0257
			10.47	2.57

While a few years ago the Brother HL-4200CN would be considered a competitive choice, it is now at the higher end (price-wise) of general color laser printers. Its features are respectable, but other models offer more for a lower price. Check out the Konica Minolta magicolor 5400 family, which is considerably less expensive for roughly similar features. This Brother model needs an upgrade or a price reduction to compete.

Chart entry — page 70

DELL

Round Rock, TX
800 999 3355
www.dell.com

Vendor Profile

Dell Computer, the number one computer retailer in the US, is now putting its name on a growing set of printers. Just a few years ago, it entered the color laser printer market with three models based on Fuji Xerox engines.

Dell sells its printers both online and through catalogs. The company, through its catalogs and Website, also sells printers under other vendors' brands, but it is moving more and more toward selling its own brands.

Dell printers are distinguished by low street prices and reasonable consumables costs. These are straightforward models, intended for small-office use. They are so low priced that they have set off a series of price reductions by rivals.

Note that Dell printers are set up to work with Windows PC computers only, natural enough in that Dell is primarily a computer maker supplying printers for its clients. Remember also that unlike most of its competitors, printers are a sideline for Dell. Furthermore, note that Dell's support ratings have been slipping badly, something that should enter into your considerations. That may not make as much difference with printers, since they are far simpler than the combination of hardware and software that Dell must support in its personal computers.

Product Profiles

Dell Color Laser Printer 3010cn

5ppm color
25ppm black & white

Dell Color Laser Printer 3110cn

17ppm color
31ppm black & white

Sum-up: Low-cost color printers, yet with reasonable costs per page.

These new color laser machines (based on the discontinued Color Laser Printer 3000cn and Color Laser Printer 3100cn, respectively) have remarkable performance and

Dell Color Laser Printer 3010cn Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$40.00	2,000	$ 0.020	$ 0.020
Cyan toner	$70.00	2,000	$ 0.035	N/A
Magenta toner	$70.00	2,000	$ 0.035	N/A
Yellow toner	$70.00	2,000	$ 0.035	N/A
Drum/black	$169.99	42,000	N/A	$ 0.004
Drum/4-color	$169.99	10,500	$ 0.016	N/A
TOTAL PER-PAGE COSTS			$ 0.1412	$ 0.0240
			14.12	2.40

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features for the price. Even with many under-$500 color laser printers to choose from these days, the prices are eye-opening: the Color Laser Printer 3010cn goes for $379, while the Color Laser Printer 3110cn, with better features, is selling for $499.

Despite their competitive pricing, these are not dumbed-down models. While the 3010cn prints at a pokey 5ppm in color, it runs at a decent 25ppm in black-and-white. The 3110cn ups those figures to a respectable 17ppm in color and 31ppm in black-and-white. Both come with Ethernet standard, and they have adequate memory: 64MB on the 3010cn, upgradeable to 576MB; and 128MB on the 3110cn, upgradeable to 1,152MB. And they have reasonably powerful processors: 300MHz on the 3010cn, and 400MHz on the 3110cn.

The 3010cn does not have PostScript, while the 3110cn does. And while the 3010cn starts with a 150-sheet paper tray, the 3110cn supplements this with another 250-sheet tray. You can add a third, 500-sheet paper tray to the 3010cn for a total of 900 sheets, or add a 550-sheet tray to the 3110cn for a total of 950 sheets. Output is limited to 250 sheets on both models.

Cost per color page is 14.1¢ in color (rather high) for the 3010cn, and 9.4¢ (not bad) for color for the 3110cn. The black-and-white per-page cost for both models is 2.4¢ (very reasonable for low-end color lasers). Output is limited to 250 sheets, with no option for expansion.

As you would expect, these are pretty basic models. But the low prices make them very desirable small-office/home-office laser machines. The toner prices aren't bad for the low end of the market. On the other hand, you now have the option, for a little more money, to get machines that print far faster in color. Look at the $499 Lexmark C532n, which has PostScript, Ethernet, and 20ppm color printing. The $599 OKI Printing Solutions C5500n costs a bit more, but is similarly impressive. Also note the Hewlett-Packard Color LaserJet 3600n, which at $699 delivers 17ppm color.

Dell is the rock-bottom choice for price. But given the low prices of color laser printers in general, you might find a little bit more value without breaking the budget by looking elsewhere.

Chart entries — pages 70–71

Dell Color Laser Printer 3110cn Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$110.00	8,000	$ 0.014	$ 0.014
Cyan toner	$215.00	8,000	$ 0.027	N/A
Magenta toner	$215.00	8,000	$ 0.027	N/A
Yellow toner	$215.00	8,000	$ 0.027	N/A
TOTAL PER-PAGE COSTS			$ 0.0944	$ 0.0138
			9.44	1.38

Dell Color Laser Printer 5110cn

35ppm color
40ppm black & white

Sum-up: Excellent performance for the price.

Dell stole a march on other printer vendors by offering this impressive platform before anyone else and at a price that challenged big name competitors to reduce prices faster than they may have wanted to. At just under $1,000, the 35ppm (color) and 40ppm (black-and-white) Color Laser Printer 5110cn offers very good performance at a low price. That was amazing a year ago, though other vendors have managed to get back in the race more recently.

Dell Color Laser Printer 5110cn Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$90.00	18,000	$ 0.005	$ 0.005
Cyan toner	$230.00	12,000	$ 0.019	N/A
Magenta toner	$230.00	12,000	$ 0.019	N/A
Yellow toner	$230.00	12,000	$ 0.019	N/A
Drum/black	$169.99	35,000	N/A	$ 0.005
Drum/4-color	$169.99	35,000	$ 0.020	N/A
TOTAL PER-PAGE COSTS			$ 0.0825	$ 0.0099
			8.25	0.99

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The printer isn't lacking in other features. Ethernet is standard as is automatic duplexing. The processor is a robust 400MHz, and PostScript and PCL are standard. The printer ships with 128MB of memory, and you can extend that to 1,152MB.

We estimate the cost per page as excellent: 8.7¢ in color and around 1.0¢ in black-and-white. These are well below average and match the costs of far more expensive models from other vendors. The black page price is particularly attention-grabbing.

Paper supplies consist of a 150-sheet bypass and a 500-sheet paper tray. You can buy either a 500-sheet or a 1,000-sheet add-on as well. One limitation, and it is common in this market segment, is its small 250-sheet output tray.

But the low prices and good speed make this a very desirable small-office/home-office laser machine. Based on toner prices, it looks to be reasonable in terms of operating costs.

You should also look at the Lexmark C770n, which is slower in black-and-white and color, but comes with Lexmark's more extensive software offerings.

This is a pretty basic workgroup printer, but its price and speed are real selling points. This machine is a bargain and has ignited a rush by other vendors to lower prices.

Chart entry — page 71

GESTETNER

Greenwich, CT
203 967 5000
www.gestetner.com

Vendor Profile

A while back, Gestetner was merged into Savin, which is a subsidiary of Ricoh. Gestetner was best known as a vendor of digital duplicators, especially in the school, church, and government markets. Nowadays it also sells relabeled Ricoh printers, copiers, and fax machines under the Gestetner brand through a network of dealers. It previously used a series of direct-sales branches as well, but these have been merged into Ricoh's direct organization. Note that Gestetner announced the names of its three printers based on the Ricoh GelSprinter series. These are the GX3000, the GX3050N, and the GX5050N. These correspond to the similarly named Ricoh products on page 39.

Product Profiles

Gestetner P7431cn
8ppm full color
31ppm black & white
Same Machine as the Ricoh Aficio CL1000N
Chart entry — page 71

Gestetner C7521n

22ppm full color
22ppm black & white
Same Machine as the Ricoh Aficio CL3500N
Chart entry — page 72

Gestetner C7526dn
26ppm full color
26ppm black & white
Same Machine as the Ricoh Aficio SP C410DN
Chart entry — page 72

Gestetner C7528n
Gestetner C7528nD

28ppm full color
32ppm black & white
Same family as the Ricoh Aficio CL7200
Chart entries — pages 72–73

Gestetner C7531dn
31ppm full color
31ppm black & white
Same Machine as the Ricoh Aficio SP C411DN
Chart entry— page 73

Gestetner C7535n
35ppm full color
35ppm black & white
Same Machine as the Ricoh Aficio CL7300D
This model has been discontinued
Chart entry — page 73

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Hewlett-Packard

Santa Clara, CA
800 752 0900
www.hp.com

Vendor Profile

Hewlett-Packard (HP) needs little introduction in any discussion of printers, a market in which it exercises commanding leadership. Its current generation of color laser models is based on Canon engines, as are its monochrome laser printers. HP is offering a variety of separate product families aimed at different segments of the market.

Up until recently, HP's models were the undisputed industry standard simply because they sold far better than all the competition. But the competition, especially Lexmark, Dell, OKI, Konica Minolta, and Xerox, keeps forging ahead. HP has responded with lower prices and higher speeds.

HP has become a leader in connectivity for its printers, offering a variety of internal and external connectivity options. In addition to a variety of servers, many that are Web-ready, HP is putting increasing emphasis on wireless connectivity. Many of the models offer IEEE 802.11b (Wi-Fi) and Bluetooth wireless protocols. In general, the company offers the widest variety of connectivity options in the business.

Image quality: When it comes to image quality, we aren't going to engage in specification-driven debates about who has the highest resolution, and we don't think you should be swayed by these types of arguments either. Most of the printers in this guide deliver perfectly acceptable image quality for mainstream documents — and if you're interested in professional-level presentations or graphics printing, a good number of these models offer higher resolutions for that kind of work, too.

HP has implemented laser-modulation technology that it claims boosts the quality to 2,400dpi, even 3,200dpi levels. HP calls this "ImageREt 2400" and "ImageREt 3200" — the "REt" standing for "resolution enhancement technology" and the "2400" or "3200" loosely referring to the dpi quality level to which this supposedly equates. However, the number 2400 or 3200 is not a measure of dpi — instead of being a specification, it is merely a four-digit number selected by HP on account of the positive connotations it carries.

Either way, ImageREt is by no means the only HP technology at work under the hood to optimize image quality. HP also stresses its automatic color calibration process, which ensures consistent quality between machines and, over time, on the same machine under varying environmental conditions.

Hewlett-Packard has come up with a number of features that enhance the usability of its color printers. The newest models use a newly improved toner called ColorSphere. This product gives more accurate particle diffusion and better toner particle distribution, resulting in higher gloss and a wider color gamut. In other words, the color pages are much more vivid, which is especially useful for printing photographic images.

Second, HP updated its Web Jetadmin remote administration utility, already the best-known in the industry. Version 8.0 comes with excellent tools for color access control and color usage costs.

Finally, a recently introduced universal driver for HP printers means that you can have a single up-to-date driver for all your HP printers, rather than a tangle of different drivers. Aside from saving software clutter, this will mean that HP printer users will get the same basic dialog box no matter what model they print to.

Product Profiles

Hewlett-Packard Color LaserJet 1600
Hewlett-Packard Color LaserJet 2600n
8ppm full color
8ppm black & white

Sum-up: Decent color speed for a low price, but black speed is slow.

These new models appear to be HP's entry into the ongoing race to put out the cheapest color printer on the market. The $299 (street) Color LaserJet 1600 and $399 (street) Color LaserJet 2600n are certainly inexpensive. And for those prices, their 8ppm color printing speed stacks up well against competing bargain-priced models such as the 5ppm Xerox Phaser 6120N ($299), the 5ppm $299 Konica Minolta magicolor 2500W, and the 5ppm Konica Minolta magicolor 2530 DL ($399). But the HP printers also print at 8ppm in black-and-white, and that could be a concern for potential users.

Aside from that issue, these machines hold up well as basic desktop color printers. The Color LaserJet 1600 is the base model, printing at 600dpi resolution. It comes

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with 16MB of nonexpandable memory and, as you'd expect, uses host-based printing instead of PostScript. It has a 250-sheet standard paper tray, and you can add another 250-sheet tray for a total of 500 sheets of input. Standard output is a modest 125 sheets with no options for expansion. This machine has a 20,000-page monthly duty cycle.

The Color LaserJet 2600n adds Ethernet and has a 35,000-page duty cycle. Otherwise, these machines are identical.

Consumable costs are high for these machines, with color toner running 15.4¢ a page and black-and-white costing 3.9¢ a page. That's based on HP's list prices; we expect moderate discounts from street prices for toner.

These printers have HP's two-line LCD control panel which provides status info and alerts of printing problems.

These machines are pretty typical low-end color laser printers. Their color printing speed is decent, but the slow black printing concerns us, since typical business users would do most of their printing in black-and-white. In the $300 – $400 price range, they could get better black printing speed. But in terms of low-priced color printing, these are impressive. The Color LaserJet 2600n suffers, however, in comparison to OKI Printing Solutions C3400n ($399), which prints at 16ppm in color and 20ppm in black-and-white with comparable features for the same price.

Chart entries — page 74

Hewlett-Packard Color LaserJet 2605dn
Hewlett-Packard Color LaserJet 2605dtn

10ppm full color
12ppm black & white

Sum-up: Improved color speed at very reasonable price points.

If nothing else, Hewlett-Packard's new Color LaserJet 2605 family indicates the company is listening to its customers.

The Color LaserJet 2605 models seem to be a response to what was most likely the major gripe about the Color LaserJet 2550 models: their slow 4ppm color printing speed.

The Color LaserJet 2550 family represented a breakthrough in terms of price: they were HP's entry into the under-$500 color laser printer market.

Now come the $500 Color LaserJet 2605dn and $700 Color LaserJet 2605dtn, which more than double the Color LaserJet 2550's 4ppm color speed, printing at 10ppm in color. That's remarkable performance at this price level.

Yet, there's a drawback, even though it may be a minor one to some users: the 2605 family's 12ppm black-and-white speed is slower than the 2550 models' 20ppm. Both have PostScript 3 and standard Ethernet.

On both models, the optional paper supply is limited to one 250-sheet tray. Both machines are well equipped with 300MHz processors and 64MB of standard memory.

Like other recent color laser printers from HP, these models utilize the company's ColorSphere toner. They also have HP's ImageREt 2400 color technology, which interpolates the printers' maximum 600dpi color resolution to 2,400dpi print quality.

These are compact units designed to fit comfortably on desktops in busy, cramped workspaces.

Output is limited to a skimpy 125 sheets, which is standard for HP's low-end color laser line.

The printers are designed with HP's customary focus on ease of use. The front-panel two-line display enables users to monitor print job status and consumables supplies, and toner cartridges are accessible through a single door.

As one would expect, consumables prices run high for this family, with color toner running 15.4¢ a page and black-and-white costing 3.9¢ a page. That's based on HP's list prices; we expect moderate discounts from street prices for toner.

These models seem to be aimed at the user who wants a decent-quality desktop color laser printer and is not

Hewlett-Packard Color LaserJet 1600/2600n/2605
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$75.00	2,500	$ 0.030	$ 0.030
Cyan print cartridge	$83.00	2,000	$ 0.042	N/A
Magenta print cartridge	$83.00	2,000	$ 0.042	N/A
Yellow print cartridge	$83.00	12,000	$ 0.007	N/A
Drum/black	$173.99	20,000	N/A	$ 0.009
Drum/4-color	$173.99	5,000	$ 0.035	N/A
TOTAL PER-PAGE COSTS			$ 0.1547	$ 0.0390
			15.47	3.90

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requiring top-notch black-and-white performance. For the money, they're definitely excellent values, although their limited features and high consumables costs may lead potential buyers to consider slightly more expensive models such as the OKI Printing Solutions C5800Ldn, which sells for $799 (street) and prints at 24ppm in color and 28 in black-and-white, or HP's own Color LaserJet 3800, which also costs $799 (street) and prints at 22ppm in color and black-and-white.

Still, the Color LaserJet 2605dn and 2605dtn models represent a step in the right direction by HP of upping the quality of lower-level color laser printers while keeping costs low.

Chart entries — pages 74–75

Hewlett-Packard Color LaserJet 3600
Hewlett-Packard Color LaserJet 3600n
Hewlett-Packard Color LaserJet 3600dn
Hewlett-Packard Color LaserJet 3600dtn

17ppm full color
17ppm black & white

Sum-up: This small-workgroup printer series offers host-based printing only but good color speed.

The Color LaserJet 3600 models are HP's lowest-cost printers that offer the same speed in black-and-white and color. They start at $599. At 17ppm, they replace the 16ppm Color LaserJet 3550 printers, and they add a little more in the way of standard paper input. The 360MHz processor is quite good for a desktop/small workgroup printer. These printers are reasonably priced, starting well under the magic $1,000 level.

Note, however, that unlike the slower Color LaserJet 2550 models, these printers do not offer PostScript or PCL. If you want PostScript, you'll want to look at other HP models.

There are four models in this family:

- The base-level Color LaserJet 3600 ($599)
- The network-capable Color LaserJet 3600n ($699)
- The 3600dn, which has automatic duplexing ($999)
- The Color LaserJet 3600dtn, which adds more paper capacity ($1,599)

The 3600 and 3600n machines have 64MB of memory, while the 3600dn and 3600dtn come with 128MB. The 3600dtn also adds a 500-sheet tray. There is no option for memory expansion. That's no big issue, given the lack of PostScript. HP calls its own printing language JetReady, and it works basically like GDI. These machines are also Mac- and Linux-compatible. HP rates them for a maximum monthly duty cycle of 50,000 pages, but recommends a much lower volume, of up to 3,000 pages.

The models have a sleek curved design, simple and elegant and suitable for desktop use. Connectivity is via USB and Ethernet (optional on the 3600). Wi-Fi is available as an option on all four models.

Paper supplies include a 100-sheet bypass (which can handle heavier stock, including envelopes and transparencies). All of the models have a 250-sheet standard paper tray. You can also add an optional 500-sheet paper tray, for a total of 850 sheets. (That 500-sheet tray is standard on the dtn model.) On the output side, there's a 250-sheet standard output tray.

Like other recently rolled-out HP printer series, this one comes with ColorSphere toner, which is designed to show very good color gloss and consistency (useful in printing photos or marketing materials). It also comes with preinstalled cartridges, so the printer is ready to go out of the box. These starter cartridges can print 5,000 black-and-white pages, 4,000 color pages. That's a nice head start before you have to worry about installing supplies.

Consumables costs are at 2.2 cents for black-and-white and 12 cents for color. These are moderate prices.

This is a formidable, speedy printer family at a low price. It has the HP administrative tools and a good-looking toner technology. The base model is far faster in color

Hewlett-Packard Color LaserJet 3600/3800
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$132.99	6,000	$ 0.022	$ 0.022
Cyan print cartridge	$129.99	4,000	$ 0.032	N/A
Magenta print cartridge	$129.99	4,000	$ 0.032	N/A
Yellow print cartridge	$129.99	4,000	$ 0.032	N/A
TOTAL PER-PAGE COSTS			$0.120	$0.022
			11.97	2.22

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than most other printers starting at under $700. But you should look at the OKI Printing Solutions 5500 and Lexmark C522 machines. They offer comparable color speeds, and the Lexmark adds on PostScript as well.

If you want a solid HP model and a moderate sticker price, this is the family to check out.

Chart entries — pages 76–77

Hewlett-Packard Color LaserJet 3000
Hewlett-Packard Color LaserJet 3000n
Hewlett-Packard Color LaserJet 3000dn
Hewlett-Packard Color LaserJet 3000dtn

15ppm full color
30ppm black & white

Sum-up: A workgroup printer series with superior black-and-white speeds and the ability to control color use.

This printer family features fast speeds in black-and-white and pretty good speed in color. Unlike some other HP models, this one is more suited for an environment where standard black-and-white office printing is required and color printing is more occasional. That's a description that fits many offices.

These printers come with a powerful 533MHz processor. The printer series supports both PCL and PostScript printing, whether from Windows PCs, Macs, or various flavors of UNIX systems. As with other newer HP printers, the color functions can be blocked for some users or for certain hours so you can have some control over the cost of color printing in a mixed-use environment. That makes especially good sense with this printer family, which you can use as your standard office printer most of the time, with color as an added feature.

There are four configurations:

- The base model, the Color LaserJet 3000 ($999), which features 64MB of memory and 350 sheets of standard input.
- The Color LaserJet 3000n ($1,199), which features 128MB of memory plus a built-in Ethernet port.
- The Color LaserJet 3000dn ($1,499), which adds standard automatic duplexing.
- The Color LaserJet 3000dtn (its price was not available as we went to press), which adds an extra 500-sheet tray as a standard feature.

All of the models have USB connectivity. Wi-Fi wireless and gigabit Ethernet connectivity are also options.

Hewlett-Packard Color LaserJet 3000
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$134.99	6,500	$ 0.02	$ 0.02
Cyan print cartridge	$127.99	3,500	$ 0.04	N/A
Magenta print cartridge	$127.99	3,500	$ 0.04	N/A
Yellow print cartridge	$127.99	3,500	$ 0.04	N/A
Drum/black	$173.99	20,000	N/A	$ 0.01
Drum/4-color	$173.99	5,000	$ 0.03	N/A
TOTAL PER-PAGE COSTS			$ 0.17	$ 0.03
			16.53	2.95

A 100-sheet multipurpose tray handles transparencies and envelopes. A 250-sheet tray is standard on all models, and a 500-sheet input drawer is optional. (It is standard on the 3000dtn.) HP recommends a volume of up to 5,000 pages per month, but its maximum duty cycle is 50,000 on the 3000n and 3000dn, and a full 60,000 pages on the 3000 and 3000dtn.

Preinstalled toner cartridges have capacity for 6,500 black-and-white and 3,500 color pages.

Consumables costs for this family come in at 16.5¢ per color page and 2.9¢ a page for black-and-white — both on the high side.

This is a very practical series for offices where color is a desired, but not constantly used, feature. The price is reasonable enough. What would make it more useful is more paper capacity: the 850-sheet total input limits the size of the workgroup that can use it. There are other models in this price range that offer more than twice the paper capacity, notably the Xerox Phaser 6300 family and the Panasonic WORKiO DP-CL22. But those models are similarly limited in output to a 250-sheet tray, so the paper capacity is less of an issue.

The Color LaserJet 3000 family offers good features for a fair price. It also offers the HP name and the upgraded administrative tools and improved color toner that come with the brand.

Chart entries — pages 75–76

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Hewlett-Packard Color LaserJet 3800
Hewlett-Packard Color LaserJet 3800n
Hewlett-Packard Color LaserJet 3800dn
Hewlett-Packard Color LaserJet 3800dtn
22ppm full color
22ppm black & white

Sum-up: Capable small-workgroup printers with good features.

The Color LaserJet 3800 family is a few steps above the Color LaserJet 3600 family in most features, including speed and, of course, price. But the most significant difference between the two families is that the 3800 models come with PCL and PostScript, which are lacking in the 3600 models. In addition, the 3800 family supports direct PDF printing.

The 3800 series replaces the discontinued Color LaserJet 3700, upgrading the speed from 16ppm to 22ppm in both color and black-and-white. These machines are aimed at small-to-mid-size offices.

There are four models in the Color LaserJet 3800 family. They are:

- The Color LaserJet 3800 ($799), which is the base model with 96MB of memory and 350 sheets of paper capacity standard.
- The Color LaserJet 3800n ($999), which is Ethernet-ready and comes with 160MB of memory.
- The Color LaserJet 3800dn ($1,299), which adds duplexing and comes with 288MB of memory.
- The Color LaserJet 3800dtn ($1,549), which adds a 500-sheet paper tray.

All of these models have a 350MHz processor. They max out at 544MB of memory. A 20GB disk drive is available.

As noted already, PostScript and PCL are standard features, so the added memory and even the disk drive may be welcome for those who run long, complex jobs. In terms of connectivity, parallel, USB, and Ethernet (optional on the 3800) are available, and Wi-Fi connectivity is as well. These machines also offer gigabit Ethernet connectivity. Mac and a variety of UNIX (Linux, AIX, Citrix) drivers are included.

The paper supplies are the same as those for the Color LaserJet 3600 printers. They include a 100-sheet bypass (multipurpose tray), a 250-sheet paper tray, and an optional 500-sheet tray (standard on the 3800dtn). There is a 250-sheet output tray. Heavy index stock can be run through the bypass.

These models come with ColorSphere toner, which is a nice improvement in color quality. It also comes with preinstalled cartridges, so the printer is ready to go out of the box. These starter cartridges can print 6,000 black-and-white pages, 6,000 color pages. We like this trend, especially since the first set-up of a printer can be a real headache.

HP hadn't determined all the consumables costs before we went to press. We have seen preliminary toner prices, and they are in line with those of similar models.

HP has flooded the small workgroup color printer market with well-featured, reasonably priced models that are all strong contenders in terms of price and features. The Color LaserJet 3800 family starts under the magical $1,000 point. Its features are straightforward but adequate for most offices. It stands up well with similarly priced printer families, such as the Lexmark C770 and OKI Printing Solutions C6100 models. Add to that the HP name and the excellent admin tools, and for many offices this might be the preferred color laser solution.

Chart entries — pages 78–79

Hewlett-Packard Color LaserJet 4700
Hewlett-Packard Color LaserJet 4700n
Hewlett-Packard Color LaserJet 4700dn
Hewlett-Packard Color LaserJet 4700dtn
Hewlett-Packard Color LaserJet 4700ph+
31ppm full color
31ppm black & white

Sum-up: A departmental color printer series that is an impressively fast upgrade to an already good product line.

The Color LaserJet 4700 family offers few frills, but it is a reliable, fast color printer series at a moderate price. At 31ppm, it's a major speed upgrade from the popular 22ppm Color LaserJet 4650 family, though it otherwise has similar features and prices. The Color LaserJet 4700 has a street price of $1,799 for the basic non-networked version. It is the least expensive model in its class (that is, printers that print at about 30ppm in both color and black). The network version, the 4700n, has a street price of $1,999. A network version with duplexing, the 4700dn, goes for $2,499. The 4700dtn adds two extra standard paper trays and goes for $3,399, while the 4700ph+ ($4,999) adds a finisher, even more paper capacity, more memory, and a hard disk.

The Color LaserJet 4700 series is based on a Canon engine that produces both full-color and black-and-white pages at 31ppm. That makes it considerably faster in color than earlier generations of Hewlett-Packard print-

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Hewlett-Packard Color LaserJet 4700 Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$178.99	11,000	$ 0.016	$ 0.016
Cyan print cartridge	$253.99	10,000	$ 0.025	N/A
Magenta print cartridge	$253.99	10,000	$ 0.025	N/A
Yellow print cartridge	$253.99	10,000	$ 0.025	N/A
TOTAL PER-PAGE COSTS			$ 0.0925	$ 0.0163
			$ 9.25	$ 1.63

ers and among the faster color laser printers on the market.

The Color LaserJet 4700, 4700n, and 4700dn come standard with a 100-sheet multipurpose tray and a 500-sheet paper tray capacity. The 4700dtn comes with three 500-sheet trays standard, for a standard capacity of 1,600 sheets. The 4700ph+ comes with a total of 2,600 sheets of input standard.

Output capacity is 500 sheets, which is better than some, but still low for heavy-duty workgroup use. The finisher on the 4700ph+ has single-position stapling of up to 30 sheets at a time, and its output tray holds up to 750 sheets. That's more limited than more robust multiposition stapling solutions found on other machines in this guide, but is suitable for simple office work. The finisher is available as an option for the other models in the family.

There are a variety of features that enhance the 4700 family's attractiveness. The printers are powered by a 533MHz processor; that is quite competitive. Processing power has become more important as the files that users print have grown in complexity.

The family has outstanding base memory of 160MB for the 4700 and 4700n, 288MB for the 4700dn and 4700dtn, and 544MB for the 4700ph+. This memory can be expanded to 544MB, which is excellent.

A 40GB hard drive (along with the added memory) allows the machine to process multipage, multi-set jobs in one shot rather than processing each set separately. This is known as multiple original printing, and its presence makes the printer a credible choice for handling a workgroup's printing needs. (The hard drive is optional on all 4700 models except the 4700ph+, where it is standard.)

There is an embedded Web server through which an IT manager or other user can oversee the printer remotely using a standard browser. These models also have job retention features. These include proof and hold (which allows you to send a job to the printer, print only the first copy for proofing, and then either release the job from the printer control panel or delete it if you find mistakes in the proof) and private (or secure) printing (which allows you to send a confidential job to the printer and hold it for release at the control panel to avoid it being seen by prying eyes). HP has been gradually introducing these features to all its laser printers, after first introducing them on its upscale monochrome models. (To activate these features, you need the hard drive.)

In terms of connectivity, aside from USB and Ethernet, there is optional IEEE 802.11b or g connectivity that allows you to print to the machine from a PC over a wireless (Wi-Fi) network. Gigabit Ethernet is supported as well. Mac and a variety of UNIX drivers are available as well.

As with other newer HP models, these printers feature HP's ColorSphere toner for superior color, especially for photographic images.

The consumables costs for the Color LaserJet 4700, at around 9.2¢ in color and about 1.6¢ in black and white, are pretty much in line with industry averages. The high-capacity cartridges, though very convenient in the long run, will involve a major initial cash outlay once the starter cartridges run out, however the color cartridges have a street cost of over $250!

The Color LaserJet 4700 is a capable printer family. If you need a color printer that will serve a department, then the extra $1,000 you'll spend over the slower models is definitely worth the price. Similarly priced models with somewhat slower speeds include the OKI Printing Solutions C7550 family and the Kyocera FS-C5030N.

The Color LaserJet 4700 series offers a menu of useful features and is solid in the areas where a color printer should be, like image quality and speed. The finisher, though somewhat limited in capacity, is a real rarity in the color laser printer world, especially at this segment of the market. It's rare that HP needs to be the price/performance leader in any segment, given its brand name advantage. But, at least for now, it has set a standard in its market segment with the Color LaserJet 4700 family.

HP's other newer color laser printers (the LaserJet 3600 and 3800) are quite well done and you can't go wrong buying them. The 4700 family is, however, a real standout that gets our Editor's Choice Award.

Chart entries — pages 79–80

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Hewlett-Packard Color LaserJet 5550n
Hewlett-Packard Color LaserJet 5550dn
Hewlett-Packard Color LaserJet 5550dtn
Hewlett-Packard Color LaserJet 5550hdn

EDITOR'S CHOICE 2007

27ppm full color
27ppm black & white

Sum-up: Affordable ledger-size printers with good speed.

The ledger-size Color LaserJet 5550 family runs at 27ppm in both black-and-white and color. These powerful machines are suited for large departments that need color printing.

There are four members in this family:

- The Color LaserJet 5550n ($3,549) comes with PostScript and PCL, along with Ethernet connectivity. It starts with 160MB of memory, a 100-sheet bypass unit, and a 500-sheet paper tray.
- The Color LaserJet 5550dn ($3,749) adds automatic duplexing.
- The Color LaserJet 5550dtn ($4,999) adds more memory (288MB) and a second 500-sheet paper tray.
- The Color LaserJet 5550hdn ($6,299) adds a 20GB hard disk (optional on the other models). It also comes with four 500-sheet paper trays, for a total of 2,100 sheets of input. While the printer series can handle paper stocks up to 53lbs., it cannot handle 110lb. card stock, which might be a concern for some users.

Hewlett-Packard Color LaserJet 5550
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$225.99	13,000	$ 0.017	$ 0.017
Cyan print cartridge	$315.99	12,000	$ 0.026	N/A
Magenta print cartridge	$315.99	12,000	$ 0.026	N/A
Yellow print cartridge	$315.99	12,000	$ 0.026	N/A
Image transfer kit	$200.00	120,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0980	$ 0.0194
			9.80	1.94

All of these models are driven by a 533MHz processor, and they can be expanded to a maximum of 544MB of memory. All of the models can be upgraded to the full 2,100 sheets of input that comes standard with the 5550hdn. HP claims that its ImageREt 3600 image enhancement is even better than the ImageREt 2400 software available on most of its other color printers.

Like other HP printer products, this series has nice management features, including an embedded Web server that works with HP's Web Jetadmin program. There's a four-line interactive display that allows you to check supply levels and diagnose and fix problems. The supplies consist of four all-in-one cartridges that are easy to replace through a front door. Consumables costs of 1.9¢ in black and 9.8¢ in color are moderate.

This is a strong ledger printer family. It does, however, lack finishing equipment, even as an option. If you want finishing, you should look at the Ricoh Aficio CL7200, a less expensive ledger printer with both a finisher and a booklet maker as options. Another strong competitor is the Lexmark C920 family, which also has a finisher. Or you can look at HP's own Color LaserJet 9500hdn. If you don't need finishing but do need ledger-size printing, the Color LaserJet 5550 series looks like a solid buy. It's earned our Editor's Choice Award.

Chart entries — pages 81–82

Hewlett-Packard Color LaserJet 9500n
Hewlett-Packard Color LaserJet 9500hdn

24ppm full color
24ppm black & white

Sum-up: Ledger-size printers with good finishing options (9500hdn only).

The Hewlett-Packard Color LaserJet 9500 is a family of ledger-size color printers. They are durable machines with solid features and, at least on the high-end model, excellent output capabilities. Note that this is no desktop model. Fully equipped, it is four feet tall.

These laser machines run at 24ppm both in color and black-and-white. That speed is supported by a fast 500MHz processor. Note that they are bested in speed by HP's newer 27ppm Color LaserJet 5550 family. Both are rated by HP for an impressive 200,000 pages a month.

PostScript is a standard feature, as is Ethernet support through an internal server. These models do not, however, offer a USB interface, though parallel connectivity is standard.

In other ways, the two members of the family, the 9500n and 9500hdn, are quite distinct. As you might suspect from the hdn suffix, the 9500hdn offers a standard hard disk and automatic duplexing. While the 9500n

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starts with 160MB of memory, the 9500hdn comes with 288MB. Both printers can be upgraded to 384MB. These printers have good color tools, including automatic color calibration as well as color-matching software.

It is on paper handling that the two machines really differ from each other. The less expensive 9500n starts with a 100-sheet multipurpose tray, along with two 500-sheet paper trays. That's a total of 1,100 sheets, and there are no options. On the output side, there is a 100-sheet face-up (bypass) tray and a 500-sheet face-down tray. Duplexing is optional.

The 9500hdn, on the other hand, has far more capacity. In addition to the basic 1,100 sheets, you get a 2,000-sheet high-capacity feeder (not available even as an option for the 9500n). That's a total of 3,100 sheets. Duplexing, as we have noted, is standard.

It's on the output side, however, that it gets even more interesting for the 9500hdn. In addition to the basic 600-sheet output capacity, there are three strong upgrades. One is a 3,000-sheet offset catch tray. The second is a 3,000-sheet finisher with 50-sheet stapling. The third option is a booklet maker with saddlestitcher, one of the few models with booklet makers in this guide. That's an impressive trio, making the 9500hdn the only model in this guide that can hold its own in a corporate repro and publishing center alongside more expensive color copiers.

Cost per page is moderate, at 9.0¢ in color, 1.8¢ in black-and-white.

As far as competition goes, we have to differentiate between the two models. The Color LaserJet 9500n has a higher price and inferior features compared to excellent machines from Lexmark, Ricoh, Xerox, and others. It is not competitive mostly because of its high price. At a street price of $6,799, we have the same concerns regarding the Color LaserJet 9500hdn, except that its booklet maker and 3,000-sheet offset catch tray are options that give you capabilities you can't get from many other printers in this guide.

The bottom line is the models have excellent image quality and an impressive duty cycle, but the price you pay for these seems out of line with the current market.

Chart entries — page 82

Hewlett-Packard Color LaserJet 9500
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$152.99	25,000	$ 0.006	$ 0.006
Cyan print cartridge	$309.99	25,000	$ 0.012	N/A
Magenta print cartridge	$309.99	25,000	$ 0.012	N/A
Yellow print cartridge	$309.99	25,000	$ 0.012	N/A
Drum/black	$297.99	40,000	$ 0.007	$ 0.007
Drum/cyan	$463.99	40,000	$ 0.012	N/A
Drum/magenta	$463.99	40,000	$ 0.012	N/A
Drum/yellow	$463.99	40,000	$ 0.012	N/A
Cleaning kit	$48.99	50,000	$ 0.001	$ 0.001
Fuser kit	$279.99	200,000	$ 0.001	$ 0.001
Transfer kit	$378.99	200,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0898	$ 0.0178
			8.98	1.78

IBM

Boulder, CO
800 358 6661
www.printers.ibm.com

Vendor Profile

IBM isn't a major player in the desktop color laser printer market, although it's worth saying that Big Blue does sell large, expensive production color machines that we don't cover in this guide.

Several years ago, IBM upgraded its monochrome laser printer line by adopting machines made by Lexmark. It has also adopted a number of newer Lexmark color printers. Unlike Lexmark, IBM does not sell each variation in the family as a separate product. Instead, it normally sells a base model and treats the variations as options. IBM sells its versions at a small premium over the Lexmark originals.

There is usually a time lag between Lexmark releases and those of IBM.

Product Profiles

IBM Infoprint Color 1334

8ppm full color
30ppm black & white

Note: Same Machine as the Lexmark C510n, which is now discontinued. This machine prints at 8ppm color, and 30ppm black-and-white. It comes with PostScript and Ethernet standard. There are 250 sheets of standard paper input, with a 530-sheet drawer available. The street price is $813.

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We expect that IBM will come out with its own versions of the Lexmark C622/C624 families in the near future to replace this model.

Chart entry — page 83

IBM Infoprint Color 1534n
IBM Infoprint Color 1534dn
20ppm full color
20ppm black & white
Same Machines as the discontinued Lexmark C524 family
Chart entries — page 83

IBM Infoprint Color 1654n Express
IBM Infoprint Color 1654dn Express

25ppm full color
25ppm black & white
Same Machines as the Lexmark C770 family
Chart entries — page 84

IBM Infoprint Color 1664n
IBM Infoprint Color 1664dn

25ppm full color
25ppm black & white
Same Machines as the Lexmark C772 family
Chart entries — pages 84–85

IBM Infoprint Color 1567

32ppm full color
36ppm black & white
Same Machine as the Lexmark C920
Chart entry — page 85

KONICA MINOLTA

Mobile, AL
800 523 2696
www.printer.konicaminolta.net

Vendor Profile

Konica Minolta's printer division has made its mark by selling affordable color printers to small businesses and home users through major retail chains.

Konica Minolta is the company that resulted from the merger of two Japanese imaging companies, Konica and Minolta. The main thrust of the company is copiers and cameras, but the company does sell office laser printers, both black-and-white and color. These printers were developed by the Minolta division known until recently as Minolta QMS, a business that was formed in 1999 when Minolta acquired Alabama-based QMS, an American vendor of laser printers.

Konica Minolta's printer group is housed at the former QMS headquarters in Alabama. The company is starting to distribute printers through Konica Minolta office equipment dealers, where they also sell copiers, faxes, and multifunctional machines. For at least some of their models, the company has also started to move into catalog sales and Internet retailing. Konica Minolta sells its printers through computer-industry channels. In the US market for color laser printers, Konica Minolta is now a presence to be reckoned with.

Note that, in an unusual move, Konica Minolta's main copier division has also released a copier-based printer, the C250P, which is sold through a different part of the company.

Product Profiles

Konica Minolta magicolor 2500W
Konica Minolta magicolor 2530 DL
Konica Minolta magicolor 2550 EN
Konica Minolta magicolor 2550 DN
5ppm full color
20ppm black & white

Sum-up: Low-cost printers with basic functions.

The new magicolor 2500 printers are replacements for the discontinued magicolor 2400 models. They print at the same speeds as their predecessors — 20ppm in black-and-white and 5ppm in color. In fact, they are very similar to the 2400 machines, the major difference being their pricing, which in the cases of the 2500W and 2530 DL is $100 cheaper than the printers they replaced.

Blazing speed is not what these machines are about. However, they do offer black-and-white printing with a little bit of color for an affordable price.

Though essentially the same printer, these three models add features progressively, justifying the differences in price. All have an estimated monthly duty cycle of 35,000 pages. They all use the same consumables, with black pages costing about 2.3¢, color pages 12.3¢. These are not cheap, but they aren't bad at the low end of the market.

The $299 magicolor 2500W is a very basic printer. It has 200 sheets of input only and 200 sheets of output,

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Konica Minolta magicolor 2500 series Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$84.99	4,500	$ 0.019	$ 0.019
Cyan toner	$129.99	4,500	$ 0.029	N/A
Magenta toner	$129.99	4,500	$ 0.029	N/A
Yellow toner	$129.99	4,500	$ 0.029	N/A
OPC drum/color	$149.00	11,250	$ 0.013	N/A
OPC drum/black	$149.00	45,000	N/A	$ 0.003
Waste toner box	$19.00	25,000	$ 0.119	$ 0.001
TOTAL PER-PAGE COSTS			$ 0.0189	$ 0.0230
			1.89	2.30

and that's it. USB connectivity is standard, while Ethernet is an option. Print resolution is 2,400 x 600dpi interpolated. A 130MHz processor is supported with 32MB of memory. You cannot add extra memory. This printer is Windows only, and uses host-based GDI printing.

The $399 magicolor 2530 DL gives you a little more than the minimum. It offers an optional 500-sheet tray for added input. It has Ethernet standard. Output resolution is 2,400dpi interpolated. It too has a 130MHz processor, and while it starts with a better 64MB of memory, you can increase that to an expansive 576MB. A duplex unit is a $229 option. While it supports only host-based printing, it does have drivers for Macintosh and Linux machines.

The magicolor 2550 machines add even more. The $499 magicolor 2550 EN has 128MB of memory and optional ($229) duplexing. The $699 magicolor 2550 DN doubles the memory to 256MB and has standard duplexing. Memory can be upgraded to 640MB on both machines. Print quality can be interpolated up to 9,600 x 600dpi.

Most important, they are PostScript printers. That gives them more flexibility in use, especially in a page layout environment.

Ethernet and USB are standard on these models, which are driven with a 300MHz processor. There's also an optional ($349) 40GB hard disk. Like the magicolor 2530 DL, they have options for another paper tray (500 sheets).

In the growing number of inexpensive color laser printers, these are solid competitors. But they've been eclipsed by low-end models from manufacturers like Lexmark and OKI Printing Solutions in terms of color speed.

Chart entries — pages 85–86

Konica Minolta magicolor 5430 DL

21ppm full color
21ppm black & white

Konica Minolta magicolor 5440 DL

27ppm full color
27ppm black & white

Sum-up: A friendly design and a good price make these models appealing choices.

The two-toned design sets off the Konica Minolta magicolor 5430 DL and 5440 DL from most other desktop models. But that's not the only selling point: the 5430 DL is one of the fastest color lasers in the $600 range, while the 5440 DL (at $999) offers outstanding performance for such a low price.

The 5430 DL prints at 21ppm in both color and black-and-white. The 5440 DL prints at the very solid speed of 27ppm, again with both black and color pages. That means you sacrifice nothing in color speed, while getting a fast enough small-workgroup black-and-white printer.

Konica Minolta is aiming this product at small businesses that want a single printer for both color and black-and-white printing. Coming at such affordable prices with good speed and easy use makes it a tempting offering for those who are tired of ink jet printers or who have never used color at all. It's also an upgrade for those who are tired of very slow color laser printer speeds of four to six pages a minute.

Both printers have solid but basic features for low-cost machines. They have a 200MHz processor and start with 64MB of memory (expandable to 576MB). They print at up to 2,400 x 600dpi interpolated resolution.

On the plus side, they come network-ready. They also are rated by Konica Minolta for a reasonably robust 60,000 pages per month.

But the limitations are there as well. These are among the most expensive printers in this guide that offer neither PCL nor PostScript, even as options. They support host-based printing both in Windows (GDI) and Macintosh environments. Konica Minolta believes that these are not critical for business users, explaining that the vast majority of users originate jobs from Microsoft Office, emails, or Internet Explorer rather than Adobe Illustrator or Quark XPress.

The magicolor 5430 DL starts off with a scanty 250-sheet paper tray, while the magicolor 5440 DL has a bet-

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Konica Minolta magicolor 5400 series Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner - high capacity	$149.99	12,000	$ 0.012	$ 0.012
Cyan toner - high capacity	$339.99	12,000	$ 0.028	N/A
Magenta toner - high capacity	$339.99	12,000	$ 0.028	N/A
Yellow toner - high capacity	$339.99	12,000	$ 0.028	N/A
Transfer belt/black	$299.00	120,000	$ 0.002	$ 0.002
2nd transfer roller	$39.00	120,000	$ 0.000	$ 0.000
TOTAL PER-PAGE COSTS			$ 0.100	$ 0.015
			10.03	1.50

ter 500-sheet standard supply. You can, however, add up to two more 500-sheet paper trays for both, for a more-than-respectable total of 1,250 or 1,600 sheets, respectively. The output tray holds the usual 250 sheets. The basic tray is letter-size only, but the add-on trays support legal-size paper. Automatic duplexing is an option. These printers support 110lb. index stock, and you can print on a variety of specialty stocks (transparencies, labels, and envelopes).

Konica Minolta is proud of the ergonomic design of these printers. The series has easy-to-replace toner cartridges, and the starter cartridges (half the capacity of the normal ones) come pre-installed. It has nice controls for checking toner and paper levels from the front panel. Like most printers, they have a Web-based administrative server, in this case called PageScope. They also come with several color-matching and management systems.

Per-page costs are acceptable for low-cost printers. Color pages cost about 10¢, and black-and-white pages around 1.5¢. Those aren't great bargains. Our prices are based on the "toner value kit" option, which reduces prices if you buy all three color cartridges at once.

You should check out competitors like the Lexmark C770n, Xerox Phaser 6300 family, Hewlett-Packard Color LaserJet 3800 family, and the OKI Printing Solutions C5500n to see models that offer comparable speeds plus a few more features.

This is an elegant design for Konica Minolta, and a good deal in price. The question is whether users will be willing to forego PostScript in a high-capacity, high-speed workgroup office printer. Certainly this will not suit graphics and page-layout users, but it makes sense for the business market.

Chart entries — page 87

Konica Minolta magicolor 5450

27ppm full color
27ppm black & white

Sum-up: Expanded features built on a fast and reliable platform.

While similar to the magicolor 5430 DL and 5440 DL (documented above), this model, the magicolor 5450, is more capable. The speed of the machine (27ppm) is the same as that of the 5440 DL, but this $1,499 printer comes fully equipped for serious work.

First of all, it adds PostScript to the mix. That was the one notable lacking feature with the other models, at least for some users. To handle more complex jobs, such as those from PostScript-generating programs like Quark XPress, this model has a much more powerful processor, at 667MHz. In addition, memory is much more robust, at 256MB to begin with and expandable to a full gigabyte (1,024MB). Furthermore, there is a 40GB hard drive available as an option.

Connectivity, as with the other models in this series, consists of both USB and Ethernet ports. PCL and PostScript are included.

Paper handling is more extensive than with the 5430 DL and 5440 DL models. There is a 100-sheet bypass tray and a 500-sheet standard tray to start with. Then you can add one or two optional trays for a total of up to 1,600 sheets. Unfortunately, there is only a 250-sheet output tray, somewhat limiting the usefulness of all this input capacity. Heavy-duty card stock can be handled by the printer.

Page costs are the same as the other 5400 series printers. That is, color pages run at about 10¢ and black printing costs around 1.5¢. That's quite high for printers this fast and this expensive.

While this is a fine printer, we think that there are others than can compete with it at a significantly lower price. You might want to consider, for example, the Xerox Phaser 6300N or Lexmark C770n, which offer similar features at a lower cost.

Chart entry — page 87

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Konica Minolta magicolor 7450

24.5ppm full color
24.5ppm black & white

EDITOR'S CHOICE 2007

Sum-up: A ledger model with high-resolution imaging.

The new Konica Minolta magicolor 7450 ($2,999) is an Ethernet-ready ledger-size machine with solid 24.5ppm speed in both color and black-and-white.

The model features software called ProArt that helps the printer obtain high (interpolated) resolution, which makes it usable for photo-quality printing. It also has built-in automatic calibration that is used to keep color quality consistent.

The printer can produce a full-bleed ledger image, extending to 12.25" x 18". That makes it suitable for page proofs for jobs going on press, among other things. You can also manually feed pages up to 11" x 35" through a single-sheet feed tray that comes with the duplexer.

Based on a Fuji Xerox engine, the 7450 comes with 256MB of RAM and can be upgraded to 1,024MB. That's not bad, but you might consider upgrading the memory from the start, because ledger page size and PostScript support eat up memory fast.

The printer can directly handle PDF files, though you need to buy the optional 40GB hard disk to enable this feature.

There's a 250-sheet multi-purpose tray and a 100-sheet standard paper tray that come with the machine. You can add three additional 500-sheet paper trays, for a total of 1,850 sheets. Output, however, is only 350 sheets. An optional duplexer is available.

Cost per page (letter-size) is not very exciting, but it's not far out of line from competitors. Our estimated black-and-white page cost is around 1.7¢, while color pages, using standard yields for comparison, run at 9.0¢.

Other ledger printers in this price range include Xerox's Phaser 7400 family (36ppm in color), which offers much faster speed and optional finishing. The Ricoh Aficio CL7200 family also deserves a close look.

This is a reasonably priced ledger machine with decent speed and passable features. Many other machines that boast high-end color quality cost far more. On the whole this is a decent buy, but note that it is not the least expensive ledger model in the color laser market and that there is no finishing available and only a very small output tray. Still, for its many benefits, it gets our Editor's Choice Award.

Chart entry — page 88

Konica Minolta magicolor 7450
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$169.00	15,000	$ 0.011	$ 0.011
Cyan toner	$219.00	12,000	$ 0.018	N/A
Magenta toner	$219.00	12,000	$ 0.018	N/A
Yellow toner	$219.00	12,000	$ 0.018	N/A
Black drum	$199.00	50,000	$ 0.004	$ 0.004
Cyan drum	$189.00	30,000	$ 0.006	N/A
Magenta drum	$189.00	30,000	$ 0.006	N/A
Yellow drum	$189.00	30,000	$ 0.006	N/A
Waste toner box	$29.00	18,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0905	$ 0.0170
			9.05	1.70

Konica Minolta bizhub C250P

25ppm full color
25ppm black & white

Sum-up: A copier-derived ledger-size printer with good paper-handling capacity.

Unlike other Konica Minolta printer models, the $7,200 bizhub C250P is based on a copier original, namely the bizhub C250.

As a printer, this model has quite good basic features, including its ability to print ledger-size pages. The 466MHz processor is matched with standard PostScript, PCL, and Ethernet connectivity. Both USB and parallel connectivity are optional features. It also comes with an expansive 512MB of memory, but that is also the maximum available. An optional 40GB hard disk is available. The model has a 75,000 page-per-month duty cycle.

In paper handling, however, this machine shines, a consequence of its copier background. The standard paper supply is 850 sheets, including a 100-sheet bypass and a multipurpose 250-sheet paper tray for special stock and a regular 500-sheet tray. There's also a 2,500-sheet large-capacity tray available as an option. That's a maximum input capacity of 3,350 pages. Duplexing is optional. The bizhub C250P can handle a wide variety of media, including heavy stock (up to 140lb. card stock) and transparencies.

Output options include:

- A multi-position stapling finisher ($1,580) with sort, group, and corner staple functions

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- A booklet finisher ($3,000) with sorting, stapling, and saddlestitching of booklets up to 60 sheets.
- A punch kit ($525) with 2-/3-hole punching that can be added to the booklet finisher

Konica Minolta includes its PageScope utilities for managing the printer from an administrator's PC, both in terms of administration and workflow.

As a copier, the bizhub C250P holds up well. Its optional job separator tray enables users to separate individual copies like copier trays do. With its optional duplex unit, the machine can produce two-sided copies. And its substantial paper supply supports big copy runs.

The bizhub C250P isn't cheap, but that's not surprising considering its copying capability and impressive performance levels. It's a hybrid of a strong copier and a first-rate laser printer. It stacks up well against its more powerful sibling, the bizhub C352P (see below), offering similar features for nearly $3,000 less, with the major concession being slower (but still decent) print speed. If that extra 10ppm the bizhub C352P offers isn't essential, the bizhub C250P is an impressive value for those looking for color printing and copying in one package.

Chart entry — page 88

Konica Minolta bizhub C352P

35ppm full color
35ppm black & white

Sum-up: Innovative color model offering solid value and performance.

This new product strengthens Konica Minolta's position as a key player in the fast-growing high-end color laser printer field. The $10,150 bizhub C352P outputs at 35ppm in color and black-and-white. It prints at 600dpi resolution. It's based on the company's popular bizhub color copier line — hence the "P" to indicate it's a print-focused machine.

The bizhub C352P is intended to be a workhorse. It has an impressive monthly duty cycle of 100,000 pages. It has 512MB of built-in memory, which, rather surprisingly, isn't expandable.

Like its slower sibling, the bizhub C250P (see above), the bizhub C352P can also be used as a copier and scanner. Its standard duplexing unit (optional on the C250P) supports double-sided copying, and with the optional 40GB hard drive, it can store scanned jobs for printing at a later point.

The machine has Konica Minolta's Emperon controller, which features the company's OP architecture. (The OP stands for Open Platform.) This controller runs the print, copy, and scan functionality of the printer using a common operating system.

The bizhub OP architecture also makes possible the company's bizhub Open API capability, which allows third-party software vendors to develop software for use with bizhub machines. Examples of such software include PageScope Data Administrator, which manages device user lists, enables account tracking, and manages password and security functions; and Web Connection, which establishes an online status monitoring site.

This printer runs PostScript and PCL printer languages. Finishing options include:

- A multi-position stapling finisher ($1,580) with sort, group, and corner staple functions
- A booklet finisher ($3,000) with sorting, stapling, and saddlestitching of booklets up to 60 sheets
- A punch kit ($525) with 2/3-hole punching that can be added to the booklet finisher

The bizhub C352P has standard duplexing and can handle up to 140lb. index paper. It can also print on envelopes or coated paper, and print 11" x 17" images on up to 12" x 18" paper to preserve crop marks, color bars, and margins.

The machine has a dual-tray 750-sheet standard paper supply and 100-sheet bypass. It offers users the choice of adding a 2,500-sheet tray, resulting in a maximum paper capacity of 3,350 sheets.

Konica Minolta doesn't publish consumables costs for this printer, but we estimate they're very reasonable.

Security functions include job encryption, hard drive locking, secure printing, address filtering, user authentication, and scan encryption. Those features will go a long way toward protecting sensitive information.

This is a solid machine that offers innovative technology, good features, and reasonable pricing. Its limit on memory expansion is a little troubling, since a workhorse like this could use all the memory it can get, especially if it's used to run high-volume multiple-user jobs. But it still rates highly based on its abundant strengths.

Chart entry — page 88

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KYOCERA

Fairfield, NJ
800 222 6482
www.kyoceramita.com

Vendor Profile

Kyocera Mita America, which now brands its printers under the Kyocera name, has built a reputation in the market as a manufacturer of rugged high-volume departmental printers with low operating costs. These are sturdy units with excellent features, but they tend to cost a little more than the competition. In a tough market, Kyocera is holding its own, but it is under the gun to keep improving its models and lowering its prices to keep up with the competition.

Kyocera models offer excellent value when it comes to supply costs, an important advantage for heavy users. The reason for this is the durability of the drums offered with the printers, drums that are built to last three or four times longer than those of rivals. That durability translates into lower operating costs.

Kyocera products are sold through the company's copier dealer network as well as through value-added resellers (VARs).

Product Profiles

Kyocera FS-C5015N
17ppm full color
17ppm black & white
Kyocera FS-C5020N
17ppm full color
17ppm black & white
Kyocera FS-C5025N
22ppm full color
22ppm black & white
Kyocera FS-C5030N
26ppm full color
26ppm black & white

EDITOR'S CHOICE 2007

Sum-up: Outstanding per-page costs make this a great choice for busy offices that output lots of pages.

As we were going to press, we learned the FS-C5020N was being discontinued.

These models are Kyocera's second-generation entries into the LED color printer arena, replacing the FS-C5016N. The $1,759 (estimated street price) FS-C5020N runs at 17ppm in both black-and-white and color and is powered by a 400MHz processor, while the $2,099 FS-C5030N runs at 26ppm in both modes and has a 600MHz processor. Prices were not available at press time for the new FS-C5015N (which appears to be an enhanced version of the FS-C5020N, and like that model runs at 17ppm in color and black-and-white) or the FS-C5025N (which runs at 22ppm in color and black-and-white). We estimate street prices for the FS-C5015N and FS-C5025N to be around $1,400 and $1,600, respectively.

Otherwise these models are identical. They all come Ethernet-ready, and PostScript and PCL are standard as well. That makes them both serious workgroup machines. Memory starts at a very generous 128MB, and it can be increased to a total of 1GB (640MB on the FS-C5015N and FS-C5025N), making these units capable of the most complex, multi-copy print jobs we can imagine.

These models have quite respectable paper-handling capabilities. They support letter- and legal-size output and come with a 500-sheet paper tray and a 100-sheet multipurpose tray, suitable for printing on transparencies and heavier stock. You can add up to three 500-sheet trays for a total of 2,100 sheets (except on the FS-C5015N, which only allows for one additional 500-sheet tray). Kyocera also offers an optional envelope feeder with a capacity of 70 envelopes for the C5015, C5025, and C5030N. There are few other models with dedicated envelope feeders in the color printer market, though they

Kyocera FS-C5030N
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$72.00	8,000	$ 0.009	$ 0.009
Cyan toner	$109.00	8,000	$ 0.014	N/A
Magenta toner	$109.00	8,000	$ 0.014	N/A
Yellow toner	$109.00	8,000	$ 0.014	N/A
Maintenance kit (includes drums, developers, rollers)	$618.00	200,000	$ 0.003	$ 0.003
TOTAL PER-PAGE COSTS			$ 0.0530	$ 0.012
			5.30	1.21

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are not unusual in the black-and-white market.

On the output side, There is a 100-sheet and a 500-sheet tray. You can also add a 250-sheet face-up tray. Like many other color printers, there's an imbalance between a fairly large maximum input capacity and a much smaller output capacity, though these Kyocera models do better than most. Two-sided output (duplexing) is an option as well. No finishing is offered, but that is expected at this price level.

Kyocera products typically feature impressive consumables costs, and these machines are no exceptions. The black-and-white cost per page is very good for a color printer, at 1.2¢ a page. That's not nearly as good as with some black-and-white-only printers, but among color printers, it's very good indeed. The color per-page costs are even better, at 5.3¢ a page (around 8¢ on the FS-C2015). At almost half the industry average for color printing cost, that alone makes this printer a standout.

There are considerably faster printers in the price range of the Kyocera FS-C5020N, but none with as good paper-handling features. Above all, no other color printers (other than other Kyocera models) can match its price per page.

Likewise, the FS-C5030N is not the fastest at its price level (that honor might go to the 31ppm HP Color LaserJet 4700n), but it still has stronger paper handling than some rivals and a lower cost per page.

If you plan to use the printer extensively, and if you plan to produce lots of color pages, this is by far the most cost-effective letter/legal-size printer on the market. While the FS-C5020N is a fine machine, we think the faster FS-C5030N is a true standout. The new FS-C5015N and FS-C5025N appear to be fine additions to this family that gets our Editor's Choice Award.

Chart entries — pages 89–90

Kyocera FS-C8008N
Kyocera FS-C8008DN

8ppm full color
31ppm black & white

Sum-up: A fine ledger-size color laser series with outstanding operating costs.

The FS-C8008 family offers low-cost ledger-size color laser printing. The speed in color is below average (8ppm), but the speed in black-and-white is excellent (31ppm). The FS-C8008 printers also shine in two areas that Kyocera printers generally do well in: operating costs and paper handling. These features make them a viable choice in what is an increasingly competitive market.

The FS-C8008 family comes in two versions:

- The FS-C8008N ($5,525 list), which offers Ethernet connectivity standard
- The FS-C8008DN ($5,795 list), which adds standard automatic duplex and a standard hard disk

In most other ways, the two models are identical in features. The FS-C8008 family's basic specs are pretty strong. The processor runs at 400MHz, which is a respectable speed. The 128MB standard memory, which can be expanded to 640MB, is quite good as well. PostScript is standard, and wireless Ethernet is available as an option, in addition to the standard 10/100BaseT.

Speed and resolution: As noted earlier, the FS-C8008 models print at a rate of 8ppm in color and 31ppm in black-and-white. The color speed is below average in the current market, but not painfully so. On the other hand, the monochrome speed is outstanding. That and the low consumables costs make this series an interesting candidate for a mixed-use departmental printer. If you need a laser printer that will do color pages occasionally, and black-and-white frequently, this can be a good choice.

One slight disadvantage — the FS-C8008 models print at 600dpi, while some rivals print at 1,200dpi. On the other hand, it must be said that 1,200dpi resolution, while a nice feature, is not an absolute requirement. In spite of the jump in resolution, the difference in appearance between color documents printed at these resolutions can be hard to detect. (You might, however, look at some test pages and compare them with output from one or two competitors.)

Paper handling: The FS-C8008 family, like other Kyocera products, offers excellent paper-handling options. The FS-C8008N supports 1,150 sheets of paper capacity standard, an above-average total. This figure can be increased to 3,150 sheets by adding four optional paper drawers. Note that the duplexing unit fits into one of the standard drawer spaces, so the FS-C8008DN offers only 650 sheets out of the box, with a total capacity of 2,650 sheets.

The output side gets even more interesting. The default 650-sheet output capacity can be supplemented using two different options:

- A 3,000-sheet offset catch tray, or
- A 2,000-sheet finisher with 20-sheet stapling and three output bins

Note that in order to use the finisher, you'll need to buy both optional 500-sheet paper drawers.

Traditionally, color printers have offered very little in terms of output options. Clearly, manufacturers like

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Kyocera believe that color printers should come with the same kinds of options as you would expect from monochrome departmental printers or, for that matter, color copiers. The FS-C8008 printers have some of the most extensive paper-handling capacities in the color laser printer market.

Cost of consumables: This is an area where the Kyocera models really shine. Black-and-white pages cost around 0.8¢ per page, a remarkably low figure, even for a dedicated black-and-white machine. For many other color printers, the per-page cost for black-and-white output is around 2¢. This truly makes the FS-C8008-series printers candidates for everyday departmental printing.

But the FS-C8008's color per-page cost is even more exciting. At around 4.5¢ a page, it's far lower than most competitors'. Color printing doesn't get more affordable than this, and it makes the FS-C8008 series very attractive. The payback over the life of a heavily used printer can be considerable.

Kyocera explains that one of the main reasons behind its low consumables costs is the company's long-life amorphous silicon drum technology, which makes the intervals between drum replacements exceptionally long. In addition, Kyocera's toner costs are very reasonable.

We think this is a strong printer series. It does have a higher sticker price than some of the competition (calculating from its list price). It also has a relatively slow color printing speed. On the other hand, it offers excellent output options. But the main feature is that it's economical to run.

Kyocera FS-C8008
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.00	25,000	$ 0.004	$ 0.004
Cyan toner	$90.00	10,000	$ 0.009	N/A
Magenta toner	$90.00	10,000	$ 0.009	N/A
Yellow toner	$90.00	10,000	$ 0.009	N/A
Drum/black	$1,093.00	600,000	N/A	$ 0.002
Drum/4-color	$1,093.00	150,000	$ 0.007	N/A
Developer/black	$674.00	300,000	$ 0.002	$ 0.002
Developer/3-color	$476.00	300,000	$ 0.005	N/A
TOTAL PER-PAGE COSTS			$ 0.0453	$ 0.0080
			4.53	0.80

It should be said, however, that price levels in the ledger-size category of the color printer market continue to erode, and the speed of color printing is increasing. Therefore, Kyocera is facing ever-stiffer price competition. The cost-per-page advantage that makes it less expensive in the long run might be obscured by its higher sticker price. In other words, this printer series can still hold its own against such rivals as the Ricoh Aficio CL7200 and the Lexmark C920, but you have to look at total cost of ownership.

If you believe that price per page is the most critical issue, more than color printing speed, and anticipate running high volumes, the Kyocera FS-C8008 family is an excellent choice.

Chart entries — page 90

Kyocera FS-C8026N-A
Kyocera FS-C8026N-B

26ppm full color
26ppm black & white

Sum-up: Lots of paper capacity and excellent finishing mark these deluxe models.

This Kyocera model, the FS-C8026N, comes in two different configurations, denoted by the suffixes A and B. The difference between the two is in terms of paper handling only. Even the prices are the same, at $9,498 list. That's a major league price, but these machines come with a fuller configuration out of the box than other printers in this sector.

These ledger-size printers handle letter-size pages at a rate of 26ppm, both in black-and-white and color. The estimated monthly duty cycle is 100,000 pages. A 600MHz processor is supported by 512MB of memory (also the maximum memory). There's also a 20GB hard disk standard.

PostScript and PCL are standard. Connectivity is through a standard Ethernet interface. Unusually, there is no USB port, but that's probably no big deal as this machine is really intended for a workgroup. Wireless Ethernet is also an option.

As noted above, paper capacity is where these machines vary. The FS-C8026N-A comes with a 150-sheet bypass and paper input units of 500, 1,000, and 1,500 sheets each. That makes for a total input capacity out of the box of 3,150 sheets. The FS-C8026N-B comes with the same 150-sheet bypass and three 500-sheet paper trays only, for a total of 1,650 sheets of input. Both models support automatic duplexing as a standard feature.

On the output side, the differences are similar. Standard output for the FS-C8026N-A comes in units of 150, 500,

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Kyocera FS-C8026N Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.00	25,000	$ 0.004	$ 0.004
Cyan toner	$90.00	10,000	$ 0.009	N/A
Magenta toner	$90.00	10,000	$ 0.009	N/A
Yellow toner	$90.00	10,000	$ 0.009	N/A
Drum/black	$1,093.00	600,000	N/A	$ 0.002
Drum/4-color	$1,093.00	150,000	$ 0.007	N/A
Developer/black	$288.00	300,000	$ 0.001	$ 0.001
Developer/3-color	$1,020.00	300,000	$ 0.010	N/A
Charger unit	$20.00	100,000	$ 0.000	$ 0.000
Oil kit	$49.00	25,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0516	$ 0.0089
			5.16	0.89

1,000, and 1,500 sheets. The FS-C8026N-B has a 150-sheet bypass tray and three 500-sheet paper trays. Despite the fact that these machines have quite different paper handling, they still have the same list price.

In addition, both machines have a variety of optional output devices. There's a five-bin mailbox unit with room for 150 sheets in each bin. There's a 3,000-sheet finisher with multiposition stapling of up to 50 sheets. This printer family also features a saddle- stitched unit for making booklets. You can supplement that with a punch unit, which can support 2/3-hole punching. There's also a folder available for the booklet maker.

Costs per page are extremely low, especially for color. Our reckoning gives us a price of 5.2¢ for color, around 1.0¢ for black. These are outstanding, making these printers very competitive in the market.

On the other hand, these are among the most expensive color laser printers in this guide. That's partly because Kyocera bundles so much in terms of paper handling with them. If you subtract the value of these options, you get prices closer to those of other high-end color lasers.

The FS-C8026N models are somewhat slower than some of their top competitors, including the Ricoh CL7200 and CL7300 models and the OKI Printing Solutions C9600/C9800 printers.

If you're certain you'll run lots of pages and wince at the thought of paying 8¢ or more per page, these models are an excellent buy. On the other hand, if you are spending this much money, you might want to look at some of the fine multifunctional copiers documented in our *Color Copier Guide*, machines that have similar features and add copying and scanning to the printing capability.

Chart entries — page 91

LANIER

Atlanta, GA
800 708 7088
www.lanier.com

Vendor Profile

Lanier, a major office equipment distributor, was acquired by Ricoh in early 2001. Ricoh had already acquired Savin and Gestetner, and Lanier was an obvious target since it relabeled a number of different Ricoh machines under the Lanier name. So far, the company operates independently from the other Ricoh divisions, but that may change.

Lanier mostly sells direct and concentrates on larger buyers through its direct-sales force; however, it also has some dealers. Lanier is a service-intensive supplier. Its prices include delivery, installation, training, and initial supplies.

Note that Lanier announced the names of its three printers based on the Ricoh GelSprinter series. These are the GX3000, the GX3050N, and the GX5050N. These correspond to the similarly named Ricoh products on page 39.

Product Profiles

Lanier LP031c
8ppm full color
31ppm black & white
Same Machine as the Ricoh Aficio CL1000N
Chart entry — page 91

Lanier LP222cn
EDITOR'S CHOICE 2007
22ppm full color
22ppm black & white
Same Machine as the Ricoh Aficio CL3500N
Chart entry — page 92

Lanier LP226cn
26ppm full color
26ppm black & white
Same Machine as the Ricoh Aficio SP C410DN
Chart entry — page 92

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Lanier LP231cn
31ppm full color
31ppm black & white
Same Machine as the Ricoh Aficio SP C411DN
Chart entry — page 92

Lanier LP332cdn
Lanier LP332cdtn
28ppm full color
32ppm black & white
Same Machines as the Ricoh Aficio CL7200 family
Chart entries — page 93

Lanier LP335cdn
Lanier LP335cdtn
35ppm full color
35ppm black & white
Same Machines as the Ricoh Aficio CL7300 family
This model has been discontinued.
Chart entries — pages 93–94

LEXMARK

Lexington, KY
800 358 5835
www.lexmark.com/us_home.html

Vendor Profile

Lexmark was formed when IBM spun off its typewriter and mainstream printer business back in 1991. The non-compete agreement between IBM and Lexmark expired in 1996. IBM, at that point, built up a full line of desktop printers in competition with Lexmark but a few years ago announced that it would relabel Lexmark's black-and-white and color models. Now Lexmark also provides printers to a number of companies: Toshiba, Unisys, RISO, and (in some categories) Dell.

Lexmark is a power in monochrome laser printers, where it stands (by some measures) second behind Hewlett-Packard in terms of market share. The company also sells an extensive line of color ink jet printers and has considerable market presence there. In the color laser printer market, however, Lexmark is only slowly growing bigger.

All Lexmark printers benefit from a variety of external and internal network servers and connectivity options. They also offer a sophisticated range of optional software for handling security, administration, and file conversion. These tools include ones that support printing from a number of formats (including PDF and TIFF), allow for form generation and printing, print barcodes, secure print, and allow for significant job management. Lexmark also contends that it has superior color management tools for all its color laser models.

Lexmark's current products are quite good. In speed, price, and features, they contend with everything else on the market. But the opposition isn't standing still, and Lexmark needs to keep on developing new printers to stay near the top of the pack.

Product Profiles

Lexmark C500n
8ppm full color
31ppm black & white

Sum-up: Bargain-basement price, but color is slow.

The new C500n is Lexmark's entry into the under-$400 color laser printer realm. And like other color machines in this price range, its color printing speed is slow — 8ppm. It prints in black-and-white at a speedy 31ppm, however.

Many lower-priced color laser printers share this machine's printing 8ppm/31ppm speeds, including the Brother HL-2700CN ($850), Ricoh Aficio CL1000N ($899), and TallyGenicom 8008 ($775). The main advantage the C500n has over these machines is its $399 list price, less than half of some of the competing products.

Lexmark C500N
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$133.00	3,000	$ 0.030	$ 0.030
Cyan print cartridge	$149.00	5,000	$ 0.044	N/A
Magenta print cartridge	$149.00	5,000	$ 0.044	N/A
Yellow print cartridge	$149.00	5,000	$ 0.044	N/A
TOTAL PER-PAGE COSTS			$ 0.1628	$ 0.0298
			16.30	3.00

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But as you would expect, the C500n is light on features, and users will have to accept some compromises in terms of performance.

The C500n has relatively slow first-page-out times: 13 seconds for black-and-white and 19 seconds for color. It prints at 1,200 x 600dpi standard and has a 35,000-page monthly duty cycle. It comes with 64MB of (nonexpandable) memory standard, and has a decent 200MHz processor. It doesn't run PostScript, instead utilizing Lexmark's host-based system.

On the plus side, the C500n comes with standard Ethernet, a nice feature for this price range. It also has a wireless option.

The printer has a standard 250-sheet paper supply, which can be expanded to 780 sheets. Its maximum output is 250 sheets. No optional output devices are available for this machine.

Not surprisingly, consumables costs are high. Even using Lexmark's high-yield toner cartridges will cost 3.0¢ a page for black-and-white and 16.3¢ a page for color. That's pretty steep, but typical for printers in this price range.

The C500n is simply a basic printer that seems to be designed for the casual office user who needs occasional color printing for a special project but doesn't want to spend a lot. For this type of a customer, it's an appealing bargain, offering performance comparable to far more expensive models.

Chart entry — page 94

Lexmark C530dn
Lexmark C532n
Lexmark C532dn
Lexmark C534n
Lexmark C534dn
Lexmark C534dtn

EDITOR'S CHOICE 2007

22ppm full color
24ppm black & white

Sum-up: Another Lexmark breakthrough in speed and price for color laser printing.

Three years ago, Lexmark came out with the C510 series, a very good economy model priced at $599 and up. Two years ago, the company topped itself with the C520/C522/C524 family, which printed at 20ppm in color and black-and-white, a strong performance level for such economical machines. Now these models have undergone another evolution, re-emerging as the C530/C532/C534 family, which prints at 22ppm in color and 24ppm in black-and-white. Although Lexmark hasn't raised the prices from the previous generation (in fact, Lexmark dropped the price on the C534 models by $200 each from their C524 predecessors), these machines achieve even more remarkable speed, while many of their rivals run at speeds of 4 to 8ppm in color. They also have some superior features that make them more than just minimal printers.

The six new models in the family are:

- The C532n, the base-level machine with a 250-sheet paper capacity and Ethernet, along with 128MB of memory. ($499)
- The C530dn, a retail-channel version of the C532n, also $499, and almost, but not quite, identical. The major differences: the C530dn adds duplexing but has a 65,000-page duty cycle, while the C532n has a 75,000-page duty cycle but no duplexing. The C532n also has higher supply yields than the C530dn.
- The C532dn ($699), which is identical to the C532n except it adds standard duplexing.
- The C534n, which adds a faster processor and an optional hard disk, as well as networking and also has 128MB of standard memory ($699).
- The C534dn, which adds standard automatic duplexing to the C534n. ($999)
- The C534dtn, which adds an extra 500-sheet tray ($1,299).

Lexmark C530/C532/C534
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$95.00	1,500	$ 0.026	$ 0.026
Cyan print cartridge	$95.00	1,500	$ 0.040	N/A
Magenta print cartridge	$95.00	1,500	$ 0.040	N/A
Yellow print cartridge	$95.00	1,500	$ 0.040	N/A
4-color drum	$35.50	20,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1470	$ 0.0280
			14.70	2.80

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The Lexmark C532n prints color at 22ppm speed at 1,200dpi resolution.

The C530dn/C532n engine comes with a 375MHz processor, while the C534 models have a 625MHz processor. Along with a few other vendors, Lexmark has made sure that getting into color printing at the entry level no longer means making big sacrifices in speed. PostScript is a standard feature through the whole line, which is not always the case with low-priced color laser printers.

These models have decent memory capacity. They start with 128MB, upgradeable to 640MB. That much memory may be helpful, because unlike some of their low-cost competitors, these are Postscript-based machines, making them useful for a wide variety of graphics applications. The models print at a resolution of 1,200dpi. A 40GB hard disk is an option on the C534 models.

Paper capacity is limited, based on the standard 250-sheet paper tray, a 100-sheet MPF feeder (except for the C534n, which has a manual MPF feeder), and an optional 550-sheet paper tray (standard on the C534dtn). There is a 250-sheet output tray. Duplexing is standard on all of these models except for the C532n and C534n.

USB is standard, as is Ethernet. Wireless 802.11b Ethernet is an option as well.

Lexmark hasn't published supply costs for these new models yet, but we anticipate they'll be on the high end: around 2.8¢ for black pages and 14.7¢ for color. The good thing about these machines' consumables is their higher capacity: black cartridges print 5,000 pages, while the three color cartridges last for 3,000 pages.

Lexmark believes what sets its machines off from competitors' is a more extensive set of color-printing controls, much like those found on higher-cost printers. This series also allows the administrator to lock out some users from use of color, a good feature for a workgroup in which only some users really need color and where you want to keep costs down. Like other Lexmark models, there is an extensive suite of software available, with support for barcodes, and for forms creation and printing.

But where these machines have everyone else beat is in sheer speed for the price. Other low-cost models print at a relatively slow speed in color, from 4ppm to 8ppm in color. At 22ppm color printing, this family has remarkable speed, setting a new standard for low-cost color lasers. Plus it has standard PostScript, a unique feature in this price class.

As such, it competes very well with a slew of low-cost printers from Dell and others. The C532n is particularly a standout, while the C534 models are quite solid as well, if a little less unique.

Making a workgroup color printer for under $1,000 that has decent color control software is a nice plus. What's remarkable is that its 22ppm color speed makes it a creditable workgroup printer on its own. This family gets our Editor's Choice Award.

Chart entries — pages 94–96

Lexmark C770n
Lexmark C770dn
Lexmark C770dtn

EDITOR'S CHOICE 2007

25ppm full color
25ppm black & white

Sum-up: A strong small-workgroup printer family, but with tough rivals.

The new C770 family is one of two similar color laser printer families. At 25ppm in both color and black-and-white, these models are very affordable mid-range color lasers. The printers have relatively modest paper handling, but they otherwise have a solid but standard set of features.

The three models in this family are:

- The C770n is the base model, with 600 sheets of standard input and 256MB of memory, along with standard Ethernet connectivity ($999).
- The C770dn adds automatic duplexing ($1,299).
- The C770dtn adds another 500 sheets of input standard and holds up to 256MB of memory ($1,549).

Based on an 800MHz processor, these machines are

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Lexmark C770 Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$111.00	6,000	$ 0.019	$ 0.019
Cyan print cartridge	$203.00	6,000	$ 0.034	N/A
Magenta print cartridge	$203.00	6,000	$ 0.034	N/A
Yellow print cartridge	$203.00	6,000	$ 0.034	N/A
Waste toner bottle/black	$13.00	150,000	$ 0.000	$ 0.000
Waste toner bottle/3-color	$13.00	50,000	$ 0.000	N/A
Maintenance kit	$582.00	120,000	$ 0.005	$ 0.005
Fuser kit	$343.00	150,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1275	$ 0.0257
			12.75	2.57

more than adequately powered. Memory starts at 256MB and can be augmented to 768MB. A 40GB hard disk is an (expensive) option. PostScript 3 also comes standard.

Connectivity is through USB and Ethernet. A Wi-Fi interface (IEEE 802.11b) is also available.

The paper supplies, as we have stated, are limited. These models come with a 500-sheet paper tray and a 100-sheet bypass. There's an extra 500-sheet tray, optional on all but the C770dtn model. Output is limited to only 250 sheets. The printer can, however, handle card stock. Lexmark rates the duty cycle at 100,000 pages a month.

Consumables are on the high side. You'll spend 2.6¢ per black-and-white page and 12.8¢ for color. Such prices are, unfortunately, increasingly typical even for midrange color printers. They offset the low prices of the machines themselves.

The HP Color LaserJet 3800 family has a slower speed (22ppm) at a similar price. The Lexmark C770 family has a little advantage in the way of paper supply (1,100 versus 850 sheets), but it's very hard to choose between the two. It comes down to which of the two vendors you prefer and which of the extra features they supply you prefer. Both are very good choices.

The C770 family offers good features at a moderate price. It has strong competition from a number of other color printers in its speed and price range. Still, this family is deserving of our Editor's Choice Award.

Chart entries — pages 96–97

www.betterbuys.com

Lexmark C772n
Lexmark C772dn
Lexmark C772dtn

EDITOR'S CHOICE 2007

25ppm full color
25ppm black & white

Sum-up: Capable color printers that offer serious production capacity at a moderate price.

The new C772 series is similar in many ways to the C770 series. The engines, speeds, and most of the configurations are exactly the same as that model family. So what is the difference?

The family members are:

- The C772n is the base model, with 600 sheets of standard input, 256MB of memory, and standard Ethernet ($1,499).
- The C772dn adds automatic duplexing ($1,799).
- The C772dtn adds another 500 sheets of input ($2,099).

In fact, these machines have exactly the same standard features as the C770 models: 800MHz processor, 768MB maximum memory, PostScript 3, optional wireless. What they do have that's different is potential to expand.

You have a wide variety of input options. On all the models, you can have up to two 500-sheet paper trays in total, or you can add a 2,000-sheet high-capacity feeder. There's also an optional 40-envelope feeder.

These models have two unique features as well. There's an outdoor media tray that handles special media, which can be used to create signage that can withstand direct sunlight and other unusual environmental conditions. Lexmark developed this capacity based on user requests from companies like retailers that wanted colorful signs they could place at the front door. There is also a banner tray that allows you to feed 8.5" x 36" paper. These trays have robust paper-feed roller technology that can feed thicker-than-usual media.

On the output side, there's a similar choice of devices. In addition to the standard 250-sheet output tray, there's an optional 500-sheet output tray. You can also get a five-bin mailbox unit, with a total capacity of 500 sheets. Finally, there's a 2,000-sheet finisher that can staple up to 30 sheets, and that also comes with a 3-hole punch.

These models also have the ability to be upgraded to a multifunctional with the X4500 copy/scan unit, the same scanner option that was used with its predecessor.

Cost per page is less than that of the closely related

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Lexmark C772 Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$170.00	15,000	$ 0.011	$ 0.011
Cyan print cartridge	$374.00	15,000	$ 0.025	N/A
Magenta print cartridge	$374.00	15,000	$ 0.025	N/A
Yellow print cartridge	$374.00	15,000	$ 0.025	N/A
Waste toner bottle/black	$13.00	150,000	$ 0.000	$ 0.000
Waste toner bottle/3-color	$13.00	50,000	$ 0.000	N/A
Maintenance kit	$582.00	120,000	$ 0.005	$ 0.005
Fuser kit	$343.00	150,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0936	$ 0.0186
			9.36	1.86

C770. We calculate it as around 1.9¢ per black-and-white page, 9.4¢ for color. These prices are much more reasonable than those of the C770 and are pretty good in terms of the market.

Unlike the C770, the C772 series is in a specialized category — there are a limited number of color laser printers with extended options for output and input. In fact, this color laser printer family is one of the few that prints at letter/legal size that has an extended range of options, including an envelope feeder, high-capacity feeder, finisher, adequate output capacity, and a mailbox option. Most competitive models offer, for example, only 250 or 500 sheets of output, whereas the C772 models allow you to stack thousands of sheets.

In spite of added capacity (and the otherwise solid features it shares with the C770), the C772 family is quite affordable. There are, of course, very good ledger-format machines with excellent finishing options (for example, Kyocera's FS-C8008 family), but few letter or legal size ones.

Lexmark has long been clever about getting an extra bang from its development dollars. Here we have a printer family that is the higher-performance version of its virtually identical sibling, yet the market niches and prices are quite distinct.

Chart entries — pages 97–98

Update information and more
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Lexmark C920
Lexmark C920n
Lexmark C920dn
Lexmark C920dtn

32ppm full color
36ppm black & white

EDITOR'S CHOICE 2007

Sum-up: Lexmark's powerful high-speed entry in the color ledger-size printer market.

Lexmark touts the ledger-size C920's "dynamic" LED technology, claiming that it cures some of the registration problems that previous generations of LED printers encountered. In any case, we think it is a very good color printer. It's a faster version of the 28ppm C912, now discontinued.

The C920 series has speeds of 32ppm in color and 36ppm in black-and-white, and achieves this speed at an interpolated resolution of 2,400dpi. We've come a long way from just a few years ago, when 8ppm in color was considered fast.

The C920 comes in four different flavors:

- The C920 is the base version ($3,299).
- The C920n adds networking ($3,549).
- The C920dn adds duplexing ($3,749).
- The C920dtn includes automatic duplex, a second paper tray, and networking ($4,999).

All models in this family start with 256MB of memory, which can be upgraded to 1GB. They use an extraordinarily powerful 1GHz processor and feature USB connectivity and PostScript 3 support as standard. All but the base model support standard Ethernet. An optional 40GB hard drive is also available.

The C920 family comes with a standard paper capacity of 650 sheets in the base model, made up of a 100-sheet multipurpose tray and a 550-sheet tray. The C920dtn, as we have stated, comes with a second standard tray. Paper capacity can be expanded to a whopping 5,300 sheets through various combinations of options. On the output side, 650 sheets come standard with all models, though Lexmark also offers a 1,000-sheet-capacity finisher. The finisher performs single-position stapling of up to 30 sheets and has optional 3/4-hole punch.

One nice touch is the ability to print oversize sheets. The 100-sheet multipurpose feeder can hold sheets that are up to 12.5" x 36".

An optional feature you may want to add is Lexmark's

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Lexmark C920 Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black print cartridge	$220.00	15,000	$ 0.015	$ 0.015
Cyan print cartridge	$302.00	14,000	$ 0.022	N/A
Magenta print cartridge	$302.00	14,000	$ 0.022	N/A
Yellow print cartridge	$302.00	14,000	$ 0.022	N/A
Developer/black	$54.00	28,000	$ 0.002	$ 0.002
Developer/color	$181.00	28,000	$ 0.006	N/A
TOTAL PER-PAGE COSTS			$ 0.0878	$ 0.0166
			8.78	1.66

ImageQuick card. ImageQuick is on-demand software that allows you to store forms or critical documents on an Internet server and lets users drag-and-drop to print the most up-to-date version. ImageQuick can handle a number of document formats, including PDF, HTML, GIF, PCL, PostScript, TIFF, and others. The software allows you to always print the latest documents, either from within your company or from outside. All end users need is a browser and access to a Lexmark printer.

Consumables costs run at a moderate 8.7¢ per page in color and a reasonable 1.7¢ in black-and-white.

Lexmark has a growing reputation for quality and great features, and we're pretty enthusiastic about the C920 family. The price points are also especially attractive, and these models are worthy competitors to machines from OKI, Ricoh, and Xerox. The OKI Printing Solutions 9600 has very similar features. We particularly like some of the special features on the Lexmark models, such as the automatic conversion of PDF files and the added paper capacity. These printers get our Editor's Choice Award.

Chart entries — pages 98–99

The Printer Multifunctional Guide

Small-office multifunctionals and multifunctional office printers that print up to 50ppm. These also copy, scan, and fax, and include both ink jet and laser machines that operate in black-and-white and color.

OKI

Mount Laurel, NJ
856 235 2600
www.okidata.com

Vendor Profile

Oki Data America, selling under the OKI Printing Solutions name, is a Japanese-based company that makes faxes, printers, and small-office multifunctional machines. Oki Data manufactures both monochrome and color models and is now in its third generation of laser-class color printers.

OKI uses a different imaging technology than most of the more traditional laser manufacturers in this market — it's called LED, or light-emitting diode. However, because the technology is somewhat similar to laser, we consider it laser-class for the purposes of this guide. In the past few years, several of the other key printer vendors have introduced models using LED technology, making it a little less exotic than it once was.

OKI's innovative approach also extended to the way in which its color printers lay down the four colors that are used to make up a full-color page. OKI was one of the first to use the single-pass printing method, in which there are separate black and color drums operating at the same time. That technique has now become almost universal. Some of the less expensive, slower printers in this guide use four-pass technology, in which a single drum lays down each of the four colors on the paper with a separate rotation.

The benefit of single-pass technology, also known as tandem technology, is that it allows color printers to produce color pages much faster than four-pass machines. It used to be that there was a speed downside to producing black-and-white pages on a single-pass engine — the black pages were produced at the same speed as color ones, which was often slower than competing monochrome machines. OKI's higher-end single-pass printers, however, manage to produce color pages at 36ppm, which is very fast for color, and black-and-white pages at 40ppm, which stacks up extremely well against the speeds of typical monochrome printers.

OKI Printing Solutions sells its machines through value-added resellers and the mass discount market as

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well as over the Internet. OKI also sells its printers in special product bundles directly to specific niche markets, including marketing departments, real estate offices, insurance companies, and so on.

Product Profiles

OKI Printing Solutions C3400n

16ppm full color
20ppm black & white

Sum-up: Extraordinarily low price, but features are predictably limited.

The new C3400n breaks a new price barrier for OKI Printing Solutions, as it's the company's first under-$400 color printer offering. As expected for such a price, this LED printer is a no-frills model that offers good performance but has very limited features.

The $399 C3400n prints at 16ppm in color and 20ppm in black-and-white. Those are very impressive speeds for a color laser-quality machine in this price range.

The C3400n prints at 1,200 x 600dpi resolution. It has a 200MHz processor and comes with 32MB of memory, expandable to 288MB. It has a monthly duty cycle of 35,000 pages.

Those are all very respectable ratings for this machine's price level.

But beyond basic functionality, this machine is limited, as you might expect. It has no built-in hard drive, and no option for adding one. It runs on OKI's host-based architecture, not PostScript, although that shouldn't be a problem. As implied by the "n" in the product's name, it is Ethernet-ready.

The C3400n is also limited in terms of paper handling. It has a 250-sheet paper supply but no options for adding to it. It has no duplexing option. It does, however, handle 110lb. index stock.

As you'd expect, consumables costs for this machine are high. We calculate that using OKI's high-yield toner cartridges, color pages will run 17.8¢ apiece, while black pages will cost 2.8¢ each.

The C3400n is, by nature, a low-end color printer. But it offers great performance for a low cost. For users who want solid color printing in small quantities, this could be a welcome bargain, one that has earned our Editor's Choice Award.

Chart entry — page 100

OKI C3400n
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$70.00	2,500	$ 0.028	$ 0.028
Cyan toner	$100.00	2,000	$ 0.050	N/A
Magenta toner	$100.00	2,000	$ 0.050	N/A
Yellow toner	$100.00	2,000	$ 0.050	N/A
TOTAL PER-PAGE COSTS			$ 0.1780	$ 0.0280
			17.80	2.80

OKI Printing Solutions C5500n

20ppm full color
24ppm black & white

OKI Printing Solutions C5800Ldn

24ppm full color
28ppm black & white

Sum-up: Solid performance for impressively low prices.

These new machines are steps up to OKI Printing Solutions' C3400n (see above). Like that machine, they are laser-quality LED color printers that print at 1,200 x 600dpi. At $599 for the C5500n and $799 for the C5800Ldn, they are still reasonable. But they offer more advanced features and better options than their bargain-priced sibling.

The C5500n prints at 20ppm in color and 24ppm in black-and-white, while the C5800Ldn ups those figures to 24ppm in color and 28ppm in black-and-white. Both have 60,000 monthly duty cycles. One clear improvement over the C3400n is the printers' built-in memory: the C5500n comes with 64MB and the C5800Ldn has 128MB. Memory in both is expandable to 320MB.

Like the C3400n, neither of these units has built-in PostScript. Both work with OKI's host-based architecture.

Ethernet is standard on both, and the machines have USB interfaces. Neither has a wireless option.

Where these printers truly surpass the C3400n is in their paper-handling capabilities. They have a 400-sheet paper supply, which can be expanded with the addition of a 530-sheet additional tray. Neither has a bypass tray or any additional output options.

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OKI C5500/C5800 Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$108.00	5,000	$ 0.022	$ 0.022
Cyan toner	$165.00	5,000	$ 0.033	N/A
Magenta toner	$165.00	5,000	$ 0.033	N/A
Yellow toner	$165.00	5,000	$ 0.033	N/A
Drum/black	$68.00	15,000	$ 0.005	$ 0.005
Drums (3)/3-color	$222.00	15,000	$ 0.015	N/A
Transfer belt	$145.00	100,000	$ 0.001	$ 0.001
Fuser kit	$200.00	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1434	$ 0.0296
			14.34	2.96

Duplexing is optional on the C5500n (for $179) and comes standard on the C5800Ldn. Both printers can work with 110lb. index.

Another impressive feature about these printers is their warranty: as with all OKI models, the LED printhead is covered for five years.

Consumables costs are on the high end — 14.3¢ per page for color and about 3¢ a page for black-and-white — but in terms of color printing improve upon the C3400n's high cost.

Like the C3400n, these are strong new entries in the realm of low-cost laser-quality color printing. They, too, have some limitations, which is to be expected in this price range. But they aren't as basic as the C3400n. With their memory, paper handling, and duplexing, the C5500n and C5800Ldn are bargains worth considering that have earned our Editor's Choice Award.

Chart entries — page 100

OKI Printing Solutions C7350n
OKI Printing Solutions C7350hdn
OKI Printing Solutions C7550n
OKI Printing Solutions C7550hdn

24ppm full color
26ppm black & white

Sum-up: Impressive speed and moderate prices make these models good buys.

The OKI Printing Solutions C7350 and C7550 models use an enhanced version of its LED-based single-pass technology. The models are priced as a relatively inexpensive alternative for those midrange users who don't quite require the performance (or ledger page size) of the C9600/C9800 series.

The engine that powers these machines runs at 26ppm in black — a speed that rivals many monochrome workgroup printers — and at 24ppm in color.

An important factor influencing printer performance is the power of the processor that converts the files from your computer into images that can be printed. These models use a fast 500MHz chip. That's acceptable speed for this family's $1,500–$2,000 price range, and it should keep the C7350 and C7550 series' engines humming.

These models have reasonable paper-handling capacity. The product family has a maximum paper capacity of 1,690 sheets, which is decent for this level of the market. In a nice touch, the models come with the same size paper trays that OKI supplies its monochrome printers — they hold 530 sheets instead of the usual 500. This means that you can drop in a full ream of paper before the drawer is empty, avoiding the waste that takes place when open partial reams are left lying around. Output is handled by a 100-sheet and a 500-sheet tray (both of which come standard) and is limited to 600 sheets. No finishing options are available for those models.

Configurations: The C7350 family consists of two models. The C7350n ($1,699 street), with 192MB of memory, is a parallel-port or USB printer (both interfaces are standard) offering standard Ethernet. It comes with one 530-sheet tray plus a 100-sheet bypass. Standard resolution is 1,200 x 600dpi. A 20GB hard disk is optional as well.

OKI C7350/C7550 Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$108.00	10,000	$ 0.011	$ 0.011
Cyan toner	$184.75	10,000	$ 0.018	N/A
Magenta toner	$184.75	10,000	$ 0.018	N/A
Yellow toner	$184.75	10,000	$ 0.018	N/A
Drum/black	$144.00	30,000	$ 0.005	$ 0.005
Drums (3)/3-color	$465.00	30,000	$ 0.016	N/A
Transfer belt	$273.00	60,000	$ 0.005	$ 0.005
Fuser kit	$224.00	60,000	$ 0.004	$ 0.004
TOTAL PER-PAGE COSTS			$ 0.0948	$ 0.0239
			9.48	2.39

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The OKI C7350hdn ($1,669) is the next step up in the line. It starts with 320MB of memory, and the hard disk is standard equipment. Automatic duplexing is standard, as is PostScript.

The C7550 models print at a somewhat higher resolution than the C7350s, namely 1,200dpi versus 1,200 x 600dpi. PCL and PostScript are standard features.

The C7550n ($1,516) comes with 192MB of memory and an optional hard drive. The C7550hdn ($2,029) is similar, but it has standard duplexing and a standard hard drive.

The memory on all models can be expanded to 1,024MB (1GB), though we doubt there's much advantage to going over 512MB. It's hard to imagine anyone needing that much memory, even with complex color print jobs, but it's there if you want it.

OKI has a lot of competition in the under-$2,000 category from printers that are at similar speeds in color. Check out Ricoh's SP C410DN, Konica Minolta's magicolor 5450, and Xerox's Phaser 6300, for example. The OKI C7350 does hold its own in terms of paper handling, especially in output, where it offers more than the minimal 250-sheet output trays of its competitors.

In terms of consumables costs, the C7350 does pretty well, at around 9.5¢ in color. It is not so good in black-and-white (2.4¢).

OKI now has some strong competition, but it's a strong workgroup printer family and, thanks to an increase in speed, still competitive.

Chart entries — pages 101–102

OKI Printing Solutions C6100n
OKI Printing Solutions C6100dn
OKI Printing Solutions C6100dtn
OKI Printing Solutions C6100hdn
26ppm full color
32ppm black & white

Sum-up: Speedy yet economical color laser family.

These new models offer far better speed than most economy models, with a very strong 26ppm in color and 32ppm in black-and-white.

The basic technology on the series is similar to that of other OKI Printing Solutions models. These models are ideal for small workgroups doing low-volume color printing. Aside from their affordable speed, they have a solid set of features.

The family members now being sold are:

www.betterbuys.com

OKI C6100
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$75.00	6,000	$ 0.013	$ 0.013
Cyan toner	$130.00	5,000	$ 0.026	N/A
Magenta toner	$130.00	5,000	$ 0.026	N/A
Yellow toner	$130.00	5,000	$ 0.026	N/A
Drum, black	$70.00	15,000	$ 0.005	$ 0.005
Drum, cyan	$73.00	15,000	$ 0.005	N/A
Drum, magenta	$73.00	15,000	$ 0.005	N/A
Drum, yellow	$73.00	15,000	$ 0.005	N/A
TOTAL PER-PAGE COSTS			$ 0.1098	$ 0.0172
			10.98	1.72

- The C6100n, which has a 500MHz processor, 256MB of memory, a 400-sheet paper supply, an optional hard drive, standard PostScript, and comes Ethernet-ready ($899).
- The C6100dn, which adds automatic duplexing ($1,049).
- The C6100dtn, which adds a standard 530-sheet input tray and also has automatic duplexing standard ($1,249).
- The C6100hdn, the same as the 6100dtn (except for the 530-sheet tray), and with a built-in 40GB hard drive.

At 26ppm color, 36ppm black-and-white, these printers offer speeds that would have been quite amazing a few years ago. That OKI can offer such speeds starting under $900 shows how far the industry has come.

Paper supplies consist of a standard 400-sheet tray but no bypass tray. You can also add a 530-sheet paper tray, which comes standard with the C6100dtn, to the n, dn, and hdn models. OKI hasn't released the output paper-handling capability for these models.

By our calculations, the cost of operation is above average. Black-and-white pages cost around 1.72¢, and the color cost is 11¢, also a bit higher than the 10.0¢ per page cost we think of as moderate.

The C6100 models compete well in the low-end market segment, and if you need PostScript, they work with it as

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well as with PCL.

Overall, this product family offers good value that matches or exceeds that of most other printers in its league. It's remarkable that unlike a few years ago, we can choose between a wealth of reasonably high-performance printers with decent features at such moderate prices. In that group, these OKI models stand out.

Chart entries — pages 102–103

OKI Printing Solutions C9600n
OKI Printing Solutions C9600hdn
OKI Printing Solutions C9800hn
OKI Printing Solutions C9800hdn

36ppm full color
40ppm black & white

Sum-up: A ledger-size color printer series with superior speed and good features.

These ledger-size printers are the successors to OKI Printing Solutions' excellent C9300 and C9500 printers, which had a strong track record. The models are faster, among the fastest printers we cover in this guide. In addition, they have a number of productivity-enhancing features that make them useful in office environments.

We've discussed (above) in some detail the single-pass LED technology that OKI uses on its machines. OKI Printing Solutions has managed to take that technology and speed it up considerably with this product family.

Above all, it is speed that makes this series stand out. It was considered a breakthrough not long ago to print color pages at anything faster than 6 pages per minute. And you had to pay a big premium for that speed. The few really fast machines were derived from copiers and cost over four times as much as regular color printers.

Now OKI Printing Solutions offers a family of color printers that print at 36ppm in color and 40ppm in black-and-white. With street prices in the $3,400–$7,200 range, these models aren't the cheapest, but they are priced competitively for what you get.

The C9600/C9800 series is made up of four models. They are:

- The C9600n ($3,399 street), which is the base model. It has 256MB of memory, a 720MHz processor, and standard networking.
- The C9600hdn ($4,009), which starts with 324MB of memory and a hard disk and duplexing.
- The C9800hn ($6,889), which comes with 1GB of memory and a hard disk but no automatic duplexing.

OKI C9600/C9800
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$110.00	15,000	$ 0.007	$ 0.007
Cyan toner	$380.00	15,000	$ 0.025	N/A
Magenta toner	$380.00	15,000	$ 0.025	N/A
Yellow toner	$380.00	15,000	$ 0.025	N/A
Drum/black	$145.00	42,000	$ 0.003	$ 0.003
Drums (3)/3-color	$597.00	32,000	$ 0.019	N/A
Transfer belt	$220.00	100,000	$ 0.002	$ 0.002
Fuser kit	$179.00	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1094	$ 0.0148
			10.94	1.48

- The C9800hdn ($7,189), which adds duplexing.

All of the models come standard with parallel, USB, and Ethernet interfaces, and they all offer Wi-Fi connectivity as well. They all support PCL 5e and PostScript 3 printing. Like many current printers, they can be managed remotely over the Internet.

The one-year on-site warranty is typical, and the LED printhead is guaranteed for five years. All four models output print at 1,200 x 600dpi resolution. They all have a monthly duty cycle of 150,000 pages.

The two hdn models come standard with a 20GB hard disk. While they can be used to store frequently run images or jobs, they are most useful for electronic collation of very long jobs, especially when the full job can't be maintained in memory. A 20GB hard disk is more than enough capacity.

Paper handling: Paper handling is quite good on this family, especially on the input side. First, the printers can handle ledger- and tabloid-size paper along with legal- and letter-size pages. The base model has a 650-sheet standard paper capacity, which is based on a 550-sheet paper tray. That's convenient because you can put in a full 500-sheet ream with ease, even when there are a few sheets remaining in the drawer. It also has a 100-sheet multipurpose tray (which handles letter-size sheets only but can be used for transparencies and other nonstandard materials). You can add two 550-sheet trays or one 1,590-sheet tray to all four models; the C9600hdn offers the additional option of a 1,650-sheet tray. There are other

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printers with more capacity, but we think that this is more than adequate for most offices.

The drawers have built-in sensors that identify the size of paper loaded in them, a nice plus for busy offices. You can also feed 12" x 36" paper into this machine through the 100-sheet tray, so you can make signage or small posters, another nice plus.

Output capacity is decent. These models have 600 sheets of standard output, but they also offer an optional finisher with stapling and hole punching. Some other competitors have more elaborate output options for their ledger-size color printers, but OKI Printing Solutions does pretty well in this regard.

Consumables costs for black are very good (1.5¢ a page) and about average in color.

These OKI machines are excellent business machines. They make the most sense in office environments where you need both monochrome and color capability, as well as lots of speed and ledger-size paper. The image quality is more than good enough for office users.

The biggest competition comes from Ricoh's comparably priced CL7300 family. The Ricoh model has somewhat more sophisticated finishing and output options, including higher-capacity stapling and a mailbox. It is a bit slower, especially in black. Ricoh's color operating costs are considerably lower as well. The Xerox Phaser 7400 series also offers speed and features comparable to those of this OKI family for similar pricing.

But that takes nothing away from the C9600/C9800 family. It still has adequate finishing, good input, and lots of memory. These are among the cream of the crop in the color laser-quality printer market.

Chart entries — pages 103–104

PANASONIC

Secaucus, NJ
800 742 8086
www.panasonic.com

Vendor Profile

Panasonic sells color printers under its own name using engines made by its parent company, Matsushita. The company also sells black-and-white printers, fax machines, copiers, and scanners.

Panasonic sells its color laser printers through both traditional office equipment dealers — Panasonic copier dealers, in particular — and wholesale printer channels.

Panasonic came back into the color laser market with some impressive machines a few years ago. Since then, they've upgraded those printer lines several times.

Product Profiles

Panasonic WORKiO KX-CL400
Panasonic WORKiO DP-CL18
18ppm full color
18ppm black & white

Sum-up: Solid low-cost workgroup printer series with good features and moderate operating costs.

These models mark the latest generation of Panasonic's color laser printers. With 18ppm speed in both color and black-and-white, they replace the WORKiO KX-CL500 and DP-CL21 series. The KX-CL400 is intended for retail sales, while the DP-CL18 is sold by dealers. They have similar but not identical features.

The base price for this line is $899, as Panasonic tries to stay competitive in a market that keeps lowering prices for color laser output. At 18ppm in color, this is a pretty speedy platform for a sub-$1,000 printer. It also has built-in Ethernet compatibility, making it an even better value.

Both models have some quite good standard features. USB and parallel ports complement the Ethernet port. (Wireless Ethernet is a third-party option.) They have embedded Web servers with remote administration and maintenance tools. They also have PCL 5c as a standard feature (PostScript is an option). And they offer an optional 40GB internal hard drive.

Paper capacity is pretty good. You start with a 100-sheet multipurpose bypass tray and 530-sheet paper tray. You can add one or two additional 530-sheet trays. That's a total of 1,690 sheets of paper capacity, quite good in this price range. Output capacity is the usual 250 sheets. The bypass tray can handle up to 110lb. card stock.

These printers start with 128MB, so they handle complex jobs and/or duplex printing more easily. Memory can be expanded to 512MB, appropriate for this class of printer.

Consumables costs for the KX-CL400 are reasonable, especially for the sub-$1,000 printer. We calculate the black cost per page as around 2.1¢ and the color cost as 10.0¢, quite decent. You'll have to negotiate with your dealer about consumables costs if you buy the DP-CL18.

The other major difference between the models is that duplexing is standard on the DP-CL18, optional on the KX-CL400.

These printers are good bargains, but they exist in a market with a race to the bottom in terms of price. What

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Panasonic WORKiO KX-CL400/DP-CL18/DP-CL22 Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$42.00	6,000	$ 0.007	$ 0.007
Cyan toner	$109.00	6,000	$ 0.018	N/A
Magenta toner	$109.00	6,000	$ 0.018	N/A
Yellow toner	$109.00	6,000	$ 0.018	N/A
Print cartridge/black	$145.00	15,000	$ 0.010	$ 0.010
Print cartridges (3)/3-color	$349.00	15,000	$ 0.023	N/A
Waste toner/black	$25.00	56,000	$ 0.000	$ 0.000
Waste toner (3)/3-color	$25.00	14,000	$ 0.002	N/A
Accumulator unit	$129.00	100,000	$ 0.001	$ 0.001
Transfer roller	$19.00	100,000	$ 0.000	$ 0.000
Fuser kit	$209.00	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1002	$ 0.0207
			10.02	2.07

sets them apart is good speed in color and black and the extensive (for this end of the market) paper input options. These Panasonic models have quite good consumables costs.

Once again, Panasonic has come up with a color printer with reasonable consumables costs, a fairly low sticker price, and good features.

Chart entries — page 105

Panasonic WORKiO DP-CL22

22ppm full color
22ppm black & white

Sum-up: Same basic engine as the other Panasonic models, but a little faster.

The WORKiO DP-CL22 is a somewhat faster version of the DP-CL18 (above). It runs at 22ppm in color and black-and-white. It also has a faster processor, at 600MHz, and a slightly faster first-page-out time. The price is also a little higher, at $1,199 estimated street; otherwise, its features are exactly the same. Paper capacity tops out at 1,690 sheets if you add the two optional 530-sheet trays, and duplexing is standard. Ethernet and USB are standard, wireless Ethernet optional. PostScript is an option.

The consumables are the same as the DP-CL18 as well. Like that model, it's competitive and has a reasonable price. It also has a good total paper input capacity and very strong features.

Chart entry — page 105

Ricoh

West Caldwell, NJ
800 955 3453
www.ricoh-usa.com

Vendor Profile

Ricoh is at heart a copier and fax company, albeit a diversified one. Up until a few years ago, its forays into the monochrome printer market had been inconsistent, although it has for some time offered decent printing capabilities on its copier-based multifunctional machines. But the company now sells a number of high-performance color laser printer models, which we cover in this guide. Ricoh sells these color laser printers through its network of dealers, as well as direct on the Internet through its Ricoh Online Store. It also relabels them through Gestetner, Lanier, and Savin, which are Ricoh subsidiaries.

In 2004, Ricoh bought out Hitachi's laser engine division. While Hitachi did not sell color lasers directly in the US, it has a number of resellers, including Ricoh itself.

Ricoh has an initiative it calls B2C, meaning black to color. The idea is that most offices need just an occasional color capacity mixed in with black-and-white capability. Some Ricoh models offer far faster speed in black than in color. It is as if the color printing is an extra add-on, like networking or duplexing, that is thrown in with an otherwise good black-and-white printer.

Ricoh also recently rolled out a new line of laser-quality ink jet printers using its GelSprint technology that we're covering with its laser machines.

Product Profiles

Ricoh Aficio CL1000N

8ppm full color
31ppm black & white
Note: *This model has been discontinued.*

Sum-up: Ricoh's low-end color printer is remarkably speedy in black-and-white.

The CL1000N is Ricoh's entry-level color laser printer. It has a list price of $899 and comes standard with Ethernet. What's remarkable is its 31ppm black-and-white speed. A black-and-white-only printer running at comparable speeds would be only a little less expensive.

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Then you add the reasonable 8ppm color speed and you've got a very affordable mixed-use, network-ready machine.

Other features are pretty good. First, the resolution is a good 1,200 x 600dpi. PostScript is a standard feature. Memory starts at 128MB and can be expanded to 384MB. An optional hard disk is available. A 300MHz processor offers decent performance.

Duplexing is another option. Wireless Ethernet (Wi-Fi) is optional as well. You can also upgrade this unit to a multifunctional, with the IS100E option (outlined in the text below).

This unit comes with a 250-sheet paper supply standard, and you can add an optional 530-sheet paper tray. Output is limited to 250 sheets.

The printer has an optional scanner/copier unit, called the Ricoh IS100E Flatbed Color Scanner. This CCD unit scans at 9ppm at 600dpi and has a 25-sheet, legal-size document feeder, along with a flatbed platen. The list price is $1,499. This unit supports scan-to-email (it can hold 2,000 email addresses) and scan-to-PDF, and it's connected to the printer through a parallel port or Ethernet interface.

The biggest drawback is the cost per page. The 13.9¢ cost per color page and 3.1¢ for black-and-white are high. That's particularly striking given the black-and-white printing speed. Of course, these are list prices, and you should be able to negotiate a much better price with your dealer — before you buy the machine.

The CL1000N is based on what was originally an Hitachi engine. (Ricoh bought out Hitachi's printer operations.) It's essentially the same machine as the Brother HL-2700CN. While prices are hard to compare (Ricoh shows list price only), they seem to be in the same general ballpark. The Ricoh model comes with more memory. The consumables costs appear to be somewhat higher on the Ricoh machines. Otherwise, the models are pretty similar.

All in all, this is a very strong small workgroup printer. It's relatively inexpensive, but it has some strong features. You should be able to drive a better deal with your Ricoh dealer than the list price on this machine.

Chart entry — page 106

Ricoh Aficio CL1000N Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$185.00	9,800	$ 0.019	$ 0.019
Cyan toner	$181.00	6,500	$ 0.028	N/A
Magenta toner	$181.00	6,500	$ 0.028	N/A
Yellow toner	$181.00	6,500	$ 0.028	N/A
Waste toner bottle	$13.00	11,000	$ 0.001	$ 0.001
Drum/black	$495.00	60,000	N/A	$ 0.008
Drum/4-color	$495.00	15,000	$ 0.033	N/A
Fuser unit	$247.50	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.1391	$ 0.0308
			13.91	3.08

EDITOR'S CHOICE 2007

Ricoh Aficio CL3500N

22ppm full color
22ppm black & white

Sum-up: Respectable color performance at a low price point.

The new Aficio CL3500N ($999) is a strong new model in Ricoh's color laser printer line. It follows a current trend being followed by printer manufacturers of rolling out desktop color machines with consistent speed ratings for both color and black-and-white. Low-end color laser machines released over the last few years frequently had wide gaps between color and black-and-white speeds, such as the CL1000N (above).

The CL3500N prints at 22ppm in both color and black-and-white. It's a solid performer suitable for a small workgroup. And since color printing would most likely be the main need of its users, that's a welcome improvement.

The CL3500N prints at 1,200dpi native resolution. It has a speedy 533MHz processor, and 128MB of standard memory, expandable to 512MB. An optional 20GB hard drive is available.

The printer has standard PostScript and Ethernet, as well as a USB interface. Wireless and Bluetooth connectivity are available as options.

The machine has a 530-sheet paper tray as well as a 100-sheet multipurpose bypass tray. Up to two 530-sheet trays of paper supply can be added for a maximum paper capacity of 1,690 sheets. Duplexing is available as an option. Output is limited to 250 sheets.

Ricoh also offers a multifunction option, in which an image scanner can be added to the unit.

Consumables for this unit are reasonably priced, running 8.7¢ a page for color and 1.7¢ a page for black-and-white. Those are respectable prices for an under-$1,000 color laser printer.

This is a solid workhorse ideal for small offices and

www.betterbuys.com

Ricoh CL3500N Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$31.75	5,000	$ 0.006	$ 0.006
Cyan toner	$85.75	5,000	$ 0.017	N/A
Magenta toner	$85.75	5,000	$ 0.017	N/A
Yellow toner	$85.75	5,000	$ 0.017	N/A
Drum/black	$83.25	13,000	N/A	$ 0.006
Drum/4-color	$320.25	13,000	$ 0.025	N/A
Transfer unit	$106.00	83,000	$ 0.001	$ 0.001
Waste toner bottle	$22.00	36,000	$ 0.001	$ 0.001
Fuser unit	$247.00	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0868	$ 0.0171
			8.68	1.71

workgroups. It compares well to similar offerings from Ricoh's competitors, including the Hewlett-Packard Color LaserJet 3800, the Panasonic WORKiO DP-CL22, and the Kyocera FS-C5025N. It has good paper handling for a desktop model, and the 22ppm color speed is a commendable improvement over past Ricoh color models in this price range. This printer gets our Editor's Choice Award.

Chart entry — page 106

Ricoh Aficio SP C410DN

26ppm color
26ppm black & white

Ricoh Aficio SP C411DN

31ppm full color
31ppm black & white

Sum-up: Two new standout models in terms of cost per page.

The Aficio SP C410DN and Aficio SP C411DN are new printers in the Ricoh line. The SP C410DN, which runs at 26ppm in color and black-and-white, has a $1,199 list price. Besides their speed ratings, these models are identical.

These printers include automatic duplexing and an Ethernet port. They are powered by a robust 600MHz processor. Ricoh rates them for up to 150,000 pages per month, making them solid workhorses for large workgroups.

PostScript and PCL are supported, as you would expect. These machines come with 256MB of memory, which you can upgrade to 512MB. A 40GB hard disk is an option for both.

Connectivity includes, besides standard USB and Ethernet, optional Wi-Fi or Bluetooth wireless systems. Mac and UNIX systems are supported as well as Windows PCs.

Paper handling starts with a 100-sheet multipurpose tray and a 550-page standard tray. All trays can handle heavy card stock up to 110 lb index. You can add one or two more 550-sheet trays for a maximum paper capacity of 1,750 sheets. Output is limited to a 500-sheet tray.

In this speed range, you should also look at the Kyocera FS-C5030N and Brother HL-4200CN, which can match the SP C410DN's speed. The main competition to the SP C411DN is Hewlett-Packard's Color LaserJet 4700 family, which also runs at 31ppm.

Printing costs are excellent. Black pages cost around 1.3¢; color costs are even better at 6.3¢. That's one of the best cost structures in the business, especially for a midrange printer.

Ricoh offers an upgrade to these printers that adds scanning functionality, including scan-to-email, scan-to-folder, scan-to-FTP, and scan-to-print.

These are fast workgroup-ready machines, and we assume you can buy them for a few hundred dollars less than their $1,199 and $1,599 respective list prices. With their built-in duplex and low cost of operation, the SP C410DN and SP C411DN are definitely models that deserve a close look for busy workgroups.

Chart entries — pages 106–107

Ricoh AficioSP C410DN/C411DN Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$90.00	15,000	$ 0.006	$ 0.006
Cyan toner	$215.00	15,000	$ 0.014	N/A
Magenta toner	$215.00	15,000	$ 0.014	N/A
Yellow toner	$215.00	15,000	$ 0.014	N/A
Drum/black	$165.00	50,000	$ 0.003	$ 0.003
Drum/3-color	$490.00	50,000	$ 0.010	N/A
Transfer unit	$140.00	100,000	$ 0.001	$ 0.001
Waste toner bottle	$45.00	125,000	$ 0.000	$ 0.000
Fuser unit	$195.00	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0658	$ 0.0130
			6.58	1.30

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Ricoh Aficio CL7200
Ricoh Aficio CL7200D
Ricoh Aficio CL7200DT1
Ricoh Aficio CL7200DT2
Ricoh Aficio CL7200DL

28ppm color
32ppm black & white

Sum-up: Speedy, feature-rich ledger-size printer family with low operating costs.

The Ricoh Aficio CL7200 family offers high speed and excellent features, including the capability to print at ledger size and produce folded booklets. Running at 28ppm in color and 32ppm in black-and-white, it offers excellent paper handling at reasonable prices (starting at $3,495) for the base model.

The CL7200 family has five configurations. They are:

- The base model CL7200 ($3,495 list), which starts with 1,100 sheets of input.
- The CL7200D ($3,795), which adds a duplex unit.
- The CL7200DT1 ($4,995), which adds a third 500-sheet drawer for a total of 1,600 sheets.
- The CL7200DT2 ($5,695), which adds a fourth 500-sheet drawer for a total of 2,100 sheets.
- The CL7200DL (also $5,695), which adds a 2,000-sheet stacker (replacing two of the 500-sheet drawers) for a total of 3,100 sheets.

All of the units are powered by a 733MHz processor. They start with 256MB of memory, expandable to 512MB. A 40GB hard disk is available. The estimated monthly duty cycle is a maximum of 200,000 pages.

Ethernet and USB connectivity are standard for all models. Among the options are Wi-Fi, Bluetooth, gigabit Ethernet, and even a parallel connection.

Input starts with a 100-sheet multipurpose tray and two 500-sheet trays. You can add up to two more 500-sheet trays, or a 2,000-sheet large-capacity tray. The bypass will handle up to 90lb. bond, while the standard drawers are limited to up to 28lb. bond. As noted above, 11" x 17" paper can be handled.

Output is where this model gets exciting. The standard output is a 100-sheet bypass tray and a 500-sheet standard tray. The options include a multiposition finisher that can handle up to 2,000 sheets and staple up to 50 sheets. Alternatively, there's a 1,000-sheet booklet maker that can create saddlestitched booklets of up to 50 sheets. You can add a 2/3-hole punch to either unit.

Ricoh Aficio CL7200/CL7300D
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$60.00	20,000	$ 0.003	$ 0.003
Cyan toner	$134.00	10,000	$ 0.013	N/A
Magenta toner	$134.00	10,000	$ 0.013	N/A
Yellow toner	$134.00	10,000	$ 0.013	N/A
Drum/black	$115.00	40,000	$ 0.003	$ 0.003
Drums (3)/3-color	$365.00	40,000	$ 0.009	N/A
Developer/black	$97.00	80,000	$ 0.001	$ 0.001
Developer/3-color	$330.00	80,000	$ 0.004	N/A
Fuser	$460.00	80,000	$ 0.006	$ 0.006
TOTAL PER-PAGE COSTS			$ 0.0663	$ 0.0128
			6.63	1.28

As with other Ricoh printers, the costs per page are quite low: around 1.3¢ in black and 6.6¢ in color. These are excellent costs, with few rivals in the printing segment doing better.

Ricoh has had a good track record in producing affordable, feature-laden ledger color laser printers. The CL7200 models combine very good speed, strong paper inputs, excellent finishing options, and a heavy-duty cycle. In addition, the price is very reasonable compared to far less able ledger printers. The CL7200 is a very good buy that is deserving of our Editor's Choice Award.

Chart entries — pages 107–108

Ricoh Aficio GX3000
Ricoh Aficio GX3050N

29ppm color
29ppm black & white

Ricoh Aficio GX5050N

30ppm color
30ppm black & white

Sum-up: New laser-quality GelSprint machines are outstanding bargains.

With Ricoh's rollout of three new color printers using its revolutionary GelSprint technology, the company has taken a major leap in the industry-wide quest to develop inexpensive laser-quality color machines with the low purchase price of a low-end ink jet printer.

www.betterbuys.com

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How did Ricoh do it? GelSprint is an ink jet-based technology, but with its advanced permanent print head (guaranteed to last for the life of the unit), these machines can be competitive with today's cutting-edge desktop color machines in terms of performance, quality, durability, and perhaps most importantly, consumables costs.

Just look at the specs: the $199 Aficio GX3000 and $279 Aficio GX3050N print at 29ppm in color and black-and-white, while the $369 Aficio GX5050N prints at 30ppm in color and black-and-white. The difference between print speeds of these models is minimal. Our assumption is they're about equal in terms of speed, and the GX5050N was rated 1ppm faster to differentiate it as a superior machine for marketing purposes.

Note, however, that as with conventional ink jet printers, these ratings are for draft quality (about 300 x 150dpi quality). Still, the speeds for higher quality levels are good: at 600 x 300dpi quality, the GX3000 and GX3050N print in color at 8.5ppm and the GX5050N achieves 15.5ppm speed; in high quality mode (1,800 x 600dpi quality), the GX3000 and GX3050N print color at 4.5ppm and the GX5050N prints color at 7.5ppm.

That's not all. All three machines print at native 1,200dpi resolution, which can be interpolated up to 3,600 x 1,200dpi. First print speed is under 9 seconds for the GX3000 and GX3050N, and 6 seconds for the GX5050N. Those are exceptional ratings, especially when compared to standard ink jet color machines, which are typically notoriously slow in getting out a first page.

This family begins with the base model, the GX3000, which has a 200MHz processor and 32MB of memory. It uses host-based printing. The GX3050N is virtually the same machine, except it has a 400MHz processor, 64MB of memory, and PCL compatibility. The GX3050N, as the "N" at the end of its name implies, also adds standard networking, which is available as an option on the GX3000. The top of this line, the GX5050N, doubles the GX3000's and GX3050N's 250-sheet paper supply to 500 sheets. All three machines have an optional 100-sheet bypass tray that can handle various paper stocks and sizes including envelopes, postcards, transparencies, glossy paper, and banners, and up to 68lb. stock. This tray can handle sheets up to 51" in length for banners. The standard maximum paper size is 8-1/2" x 14".

Ricoh will distribute these machines through its regular dealer network, but also will increase its market penetration by selling them (and their supplies) through retailer CDW (www.cdw.com). That's a significant change for Ricoh, which typically has only sold its consumables through Ricoh dealers. Time will tell if this outreach effort improves Ricoh's presence in the retail market.

As the "GelSprinter" name implies, these machines use a thicker, gelatin-like ink that is conveyed by the machines' printhead as droplets via two rows of nozzles. Since the droplets are larger than those of a conventional ink jet machine, they fill in images better. Since these machines don't need to heat up the gel to convey it to the paper and therefore run "cold," their print quality isn't compromised by the wet prints, smudging, or paper misfeeds that can result from the heating process associated with many ink jet machines.

The company is trumpeting the machines' permanent printhead as an innovation that will contribute to their long life and minimal maintenance. Ricoh claims these printheads will never need replacing, and due to the durability of their nozzles, their quality won't decline over time.

Ricoh hasn't announced consumables prices, but we estimate black pages will run around 2.1¢ apiece, while color pages will cost about 15¢ each. Those aren't the lowest consumables prices you'll find in this guide, but they compare favorably with those of color laser desktop machines in this family's price range.

In fact, these GelSprinter machines stack up very well against similarly priced competing color laser printers, such as the $399 OKI C3400n, which prints at 16ppm in color with consumables costs of nearly 18¢ a page, or the $299 Hewlett-Packard Color LaserJet 1600, which prints at 8ppm in color and costs 15.5¢ per color page for consumables.

The ink is noteworthy for being a step above much of the conventional ink used by ink jet printers. The GelSprinter viscous ink dries fast, doesn't smudge, blur, or bleed, and is waterproof.

Ricoh has achieved something truly special with this family of printers. They offer outstanding value for the money, with excellent speed, crisp quality, and consumables that are at least in line with similarly priced, slower color laser models. They get our Editor's Choice Award.

Chart entries — page 109

Ricoh Aficio CL7300D
Ricoh Aficio CL7300DT1
Ricoh Aficio CL7300DT2
Ricoh Aficio CL7300DL
35ppm color
35ppm black & white
***Note:** These models have been discontinued.*

Sum-up: One of the fastest and feature-rich color laser printer families.

The ledger-size Ricoh Aficio CL7300 printers are similar in many ways to the Ricoh Aficio CL7200 documented

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above, though they are (of course) faster. What is outstanding is the strong paper-handling capability, including paper weights up to 90lb. index. These models handle 12" x 18" paper, so that you can print two pages at a time, with room for trim marks and bleeds. All models have a monthly duty cycle of up to 200,000 pages.

The CL7300 family has four variations and all units come with automatic duplexing:

- The base model CL7300D ($5,095 list), which starts with 1,100 sheets of input
- The CL7300DT1 ($5,995), which adds a third 500-sheet drawer for a total of 1,600 sheets
- The CL7300DT2 ($6,740), which adds a fourth 500-sheet drawer for a total of 2,100 sheets
- The CL7300DL (also $6,740), which adds a 2,000-sheet stacker

As with the 7200 family, all of the 7300 printers are powered by a 733MHz processor. They start with 256MB of memory, expandable to 512MB. One unusual feature is a 40GB hard disk standard on all models. That allows you to run very complex jobs.

These machines come with Ethernet and USB connectivity standard. You can get a parallel port as an option. Wireless options are Wi-Fi and Bluetooth. There's also a Gigabit Ethernet option. In addition, there's a PictBridge option for direct connection to digital cameras. PostScript and PCL printing are supported, as is direct PDF printing.

Each machine has a 100-sheet multipurpose tray and two 500-sheet trays to start with. All handle ledger-size paper. There are four 500-sheet trays available, or a combination of two 500-sheet trays and a 2,000-sheet feeder. That adds up to a maximum of 4,100 sheets of input.

The options for output are better than those for many color printers. You start with a 100-sheet bypass tray and a 500-sheet standard tray. You can then add a finisher with a capacity of 2,000 sheets. It can staple up to 50 sheets at a time in several positions. Another option is a 1,000-sheet saddlestitcher/booklet maker. It can produce booklets up to 50 sheets each. A hole-punching unit, capable of making two or three holes is another option, but only if you have one of the finishers.

There is a scanner unit available, the SI3000, that lets you upgrade this printer to a multifunctional.

As with the CL7200, color pages run at about 6.6¢, while black pages cost around 1.3¢. These are among the best costs-per-page in the industry. If cost-per-page is the most critical issue, you should also look at the Kyocera models in this guide.

While this is an excellent family, you should look closely at Ricoh's CL7200 printer. Those printers are a little slower and have no standard hard disk, but otherwise are pretty much the same machines. You may find that added speed is not worth the extra money. If it's raw speed that you want, the OKI Printing Solutions C9800 models are even a bit faster, with more memory. They don't have the booklet maker option, however, and cost more than the CL7300 models.

This is an outstanding printer family with top-of-the-line features. If you need a combination of top speed and a booklet maker, it is the best choice on the market.

Chart entries — pages 110–111

RISO

Danvers, MA
978 777 7377
www.riso.com

Vendor Profile

RISO is a leader in the specialized world of digital duplicators, but it has extended its product line to printers. The company is a subsidiary of RISO Kagaku Corporation of Japan. RISO was the original inventor of the digital duplicating process, a process somewhere between copying and offset printing. (See our *High-Volume Printer & Digital Duplicator Guides* for more on this process and RISO's other products.)

In the past few years, RISO has been selling conventional printers and multifunctional machines that are versions of Lexmark products. Among their many features, they offer a way to share a single controller between a printer and a duplicator. Print jobs processed by the controller that are within the duplicator's cost-saving run-length range are sent to the duplicator, while short-run jobs are sent to the printer or multifunctional.

RISO distributes its digital duplicators through a broad-based network of dealers and direct-sales branches.

Discontinued Models?

We don't cover these "end of life" models in this volume, but they usually have been covered in previous issues. Call us at 800 247 2185 if you are interested in back issues.

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Product Profiles

RISO G752
20ppm full color
20ppm black & white
Same Machine as the now-discontinued Lexmark C752dtn
Note: That model is the predecessor to the current C762 family, and is slower and less powerful but has similar paper-handling features.
Chart entry — page 111

RISO G912
28ppm full color
28ppm black & white
Same Machine as the discontinued Lexmark C912dn
Note: That machine was the predecessor to the current C920 family, and is slower and less powerful but has similar paper-handling features.
Chart entry — page 111

SAMSUNG

Rancho Dominguez, CA
310 900 5270
www.samsungusa.com

Vendor Profile

Samsung has made its mark in the black-and-white laser printer market, becoming one of the dominant companies in that area over the past few years. More recently, the Korean company moved into color laser printing.

Samsung's printer division is growing in importance. Formerly a subunit of the conglomerate's Dallas-based telecom operation, the printer division has moved to Southern California and now has the stature of a full-fledged Samsung subsidiary — a move that has facilitated its sales, marketing, and branding efforts.

Samsung has between 200 and 300 national dealers and resellers. And it's been having success at retail stores, challenging HP in the small-office/home-office area with strong sub-$1,000 offerings.

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Product Profiles

Samsung CLP-510
Samsung CLP-510N
5ppm full color
25ppm black & white
Samsung CLP-550
Samsung CLP-550N
5ppm full color
21ppm black & white

Sum-up: Personal and small workgroup printers that face stiff competition.

These Samsung models are similar in most respects. Note that the lower-numbered models (the CLP-510 and CLP-510N) are actually a little faster than the higher-numbered ones (the CLP-550 and CLP-550N). That's because the CLP-510's engine was upgraded from the CLP-500, while the CLP-550 models are older. The CLP-550 printers offer 5ppm color printing and 21ppm black-and-white printing. The CLP-510 printers are rated at 5ppm in color, 25ppm in black. Like many of Samsung's products, this series is directed at the personal or small workgroup user.

There are four printers in this series, namely:

- The CLP-510, which is a GDI-only printer ($400)
- The CLP-510N, which adds an Ethernet card ($500)
- The CLP-550, which offers PCL 6 and PostScript 3 but no standard Ethernet ($575)
- The CLP-550N, which offers PCL 6, PostScript 3, and standard Ethernet ($671)

All four models have 266MHz processors. The CLP-510, CLP-510N, and CLP-550 start with 64MB of memory, while the CLP-550N comes with 128MB. The CLP-510 models max out at 192MB, while the CLP-550 machines can be expanded to 320MB and (for the CLP-550N) 384MB. This extra memory may be helpful, as the CLP-550 machines are PostScript-capable.

These printers are capable of running at up to an interpolated resolution of 1,200dpi. The maximum paper size is 8.5" x 14". USB, parallel, and (on the "N" models) 100BaseT Ethernet are included. A wireless Ethernet solution is available.

These printers are both Mac OS X- and Linux-compatible. These also have a feature Samsung calls "NO-

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Samsung CLP-510 Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$81.99	7,000	$ 0.012	$ 0.012
Cyan toner	$66.99	2,000	$ 0.033	N/A
Magenta toner	$66.99	2,000	$ 0.033	N/A
Yellow toner	$66.99	2,000	$ 0.033	N/A
Drum/black	$149.99	12,500	N/A	$ 0.012
Drum/4-color	$149.99	3,125	$ 0.048	N/A
Image transfer unit/black	$149.99	50,000	N/A	$ 0.003
Image transfer unit/4-color	$149.99	12,500	$ 0.012	N/A
Waste toner bottle/black	$19.99	12,000	N/A	$ 0.002
Waste toner bottle/4-color	$19.99	3,000	$ 0.007	N/A
TOTAL PER-PAGE COSTS			$ 0.1789	$ 0.0284
			17.89	2.84

NOIS," which means, as the name implies, lowered operating noise. They also offer easy toner installation and what they call "4-click" installation for software drivers.

Paper supplies start with a 100-sheet bypass and a 250-sheet paper tray. You can add a 500-sheet tray, for a total capacity of 850 sheets. All of these models offer automatic duplexing as a standard feature, a nice plus.

The CLP-510 uses different toner cartridges from those in the CLP-550, but the other supplies are the same. For both printers, however, the cost per page is quite high. We calculate it over 17¢ for a color page, over 3.0¢ for black-and-white.

These machines are fine basic color machines, but Lexmark and OKI Printing Solutions offer lower-priced models with significant speed advantages, and in the case of Lexmark, PostScript printing. A few years ago, these would have been very competitive models, but they've been overtaken by some key competitors.

These models are, nevertheless, solid performers. Samsung, with its strong position in black-and-white lasers in the retail channel, will sell plenty of them.

Chart entries — pages 112–113

Samsung CLP-600N
Samsung CLP-650N

21ppm full color
21ppm black & white

Sum-up: Sharp print quality and decent speed make this low-cost family a decent buy.

With the rollout of its new CLP-600N and CLP-650N, Samsung has become a true player in the increasingly competitive low-end color laser printer market. Like most printer vendors, Samsung doesn't publish list prices, but with street prices of $499 for the CLP-600N and $699 for the CLP-650N, these machines are sure to hold appeal for today's buyers.

The CLP-600N and CLP-650N represent a vast improvement over the CLP-510 and CLP-550 models in terms of color speed, since both of the new machines print at 21ppm in both color and black-and-white. With interpolation, they can print at up to 2400dpi resolution. This combination of decent speed and sharp printing is a main asset of this family.

These machines have a 600MHz processor, commendable for this price range. The CLP-600's 32MB of built-in memory is nothing special, especially considering that it's not expandable. Memory is far better on the CLP-650N, which has 256MB of built-in memory, expandable to 512MB.

The printers' 45,000 monthly duty cycle is decent for printers in this price range. This rating implies Samsung believes they're equipped to handle a heavier load than some other comparable machines, such as the Konica Minolta magicolor 2530 DL or Hewlett-Packard Color LaserJet 2605dn, both of which have a 35,000 page rated cycle.

Like some other machines in this price range such as the OKI Printing Solutions C5500n and C5800Ldn, these units lack a built-in hard drive. That could be a serious drawback for users who want to archive print jobs.

Samsung CLP-550/CLP-600N/CLP-650N Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.99	7,000	$ 0.014	$ 0.014
Cyan toner	$119.99	5,000	$ 0.024	N/A
Magenta toner	$119.99	5,000	$ 0.024	N/A
Yellow toner	$119.99	5,000	$ 0.024	N/A
Drum/black	$149.99	12,500	N/A	$ 0.012
Drum/4-color	$149.99	3,125	$ 0.048	N/A
Image transfer unit/black	$149.99	50,000	N/A	$ 0.003
Image transfer unit/4-color	$149.99	12,500	$ 0.012	N/A
Waste toner bottle/black	$19.99	12,000	N/A	$ 0.002
Waste toner bottle/4-color	$19.99	3,000	$ 0.007	N/A
TOTAL PER-PAGE COSTS			$ 0.1529	$ 0.0309
			15.29	3.09

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The CLP-600N also lacks PostScript support, which comes standard on the CLP-650N. Both do, however, have standard Ethernet and USB interfaces, and wireless functionality is available as an option.

Paper supply for these machines is acceptable for their price range. They have a 250-sheet tray standard and a 100-sheet bypass tray. An optional 500-sheet tray is available. Duplex isn't available, even as an option, for either machine.

Predictably, consumables costs are on the high end: 15.3¢ per color page and 3.09¢ per black page.

Still, these are respectable machines for their cost. We're concerned about the CLP-600N's modest (and limited) memory and lack of PostScript support. For these reasons, we'd go with the CLP-650N, which comes with far more memory and PostScript for only $200 more. Both machines, however, get our Editor's Choice Award.

Chart entries — page 113

SAVIN

Stamford, CT
203 967 5000
www.savin.com

Vendor Profile

Savin, a subsidiary of Ricoh, sells relabeled Ricoh printers, copiers, faxes, and digital duplicators under the Savin brand through a strong network of dealers and direct-sales branches. Savin machines are identical to their respective Ricoh counterparts.

Note that Savin announced the names of its three printers based on the Ricoh GelSprinter series. These are the GX3000, the GX3050N, and the GX5050N. These correspond to the similarly named Ricoh products on page 39.

Product Profiles

Savin CLP22
22ppm full color
22ppm black & white
Same Machine as the Ricoh Aficio CL3500N
Chart entry — page 114

Savin CLP831
8ppm full color
31ppm black & white
Same Machine as the Ricoh Aficio CL1000N
Chart entry — page 114

Savin CLP128
28ppm full color
32ppm black & white
Same Machine as the Ricoh Aficio CL7200
Chart entry — page 114

Savin CLP135 D
35ppm full color
35ppm black & white
Same Machine as the Ricoh Aficio CL7300D
This model has been discontinued.
Chart entry — page 115

SHARP

Mahwah, NJ
800 237 4277
www.sharpusa.com

Vendor Profile

Sharp is a large Japanese manufacturer that has built a solid reputation in the office equipment industry. It sells a full range of printers, copiers, and fax machines, along with several small-office and workgroup multifunctionals.

Sharp's desktop printers are based on its copiers and printer-based multifunctionals. We've included the printer-only versions in this volume. Some of Sharp's newer multifunctional models, while similar to the machines we document here, have no corresponding printer unit. They can be found in our *Color Copier Guide* (see back cover for details).

Sharp distributes its printers through a network of dealers, distributors, and retail stores.

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The Office Laser Printer Guide

Black-and-white laser printers that run at up to 49ppm. These machines can be either personal, workgroup, or departmental models.

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Sharp AR-C240P
24ppm color
26ppm black & white
Sharp AR-C260P
26ppm color
32ppm black & white
Sharp AR-C265P
26ppm color
32ppm black & white
Sharp AR-C360P
36ppm color
40ppm black & white

Sum-up: Deluxe models for professional color work.

These models bring Sharp back into the color printing market in a big way. These are ledger-size models, ones that support banner paper up to 47 inches in length. They are impressive models, loaded with solid features geared to the most demanding professional use.

The models in this family include:

- The AR-C240P ($2,999), which has 192MB of memory (expandable to 1GB), a 20GB hard drive, and prints at 24ppm in color and 26ppm in black-and-white.
- The AR-C260P ($5,795), which has 128MB of memory (expandable to 640MB), a 40GB hard drive, and prints at 26ppm in color and 32ppm in black-and-white.
- The new AR-C265P (price to be determined), which has 1GB of memory, a 20GB hard drive, and also prints at 26ppm in color and 32ppm in black-and-white.
- The top-of-the-line AR-C360P ($13,995), which has 256MB of memory expandable to 768MB, a 40GB hard drive, and prints at 36ppm in color and 40ppm in black-and-white.

The AR-C240P, AR-C260P and AR-C265P come with a 500MHz processor, while the AR-C360P has a powerful 1GHz processor. Their generous hard drives indicate these machines are ready to handle the most challenging heavy-duty production jobs. The disks also enable a secure print function.

Most notable is their processor, an EFI Fiery RIP. While EFI processors are common enough for copiers, they are rare for dedicated printers.

EFI processors are noted for their excellent ColorWise calibration and color-matching tools. Properly used, these tools ensure that the color output you produce can be adjusted to suit the kind of paper you use (whether high-gloss, recycled, or newsprint) and that you can create accurate proofs based on industry standards for printing on commercial presses.

Sharp AR-C240P/AR-C260P/AR-C265P Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$130.00	15,000	$ 0.009	$ 0.009
Cyan toner	$395.00	15,000	$ 0.026	N/A
Magenta toner	$395.00	15,000	$ 0.026	N/A
Yellow toner	$395.00	15,000	$ 0.026	N/A
Drum/black	$155.00	42,000	$ 0.004	$ 0.004
Drum/cyan	$215.00	42,000	$ 0.005	N/A
Drum/magenta	$215.00	42,000	$ 0.005	N/A
Drum/yellow	$215.00	42,000	$ 0.005	N/A
Fuser	$190.00	100,000	$ 0.002	$ 0.002
Transfer belt	$250.00	100,000	$ 0.003	$ 0.003
Waste toner bottle	$15.00	30,000	$ 0.001	$ 0.001
TOTAL PER-PAGE COSTS			$ 0.1116	$ 0.0173
			11.16	1.73

The other advantage of these tools is to hold high-color quality and to maintain it hour to hour and day to day. That makes this an excellent printer for those who are printing personalized marketing materials in color, especially brochures with photo images.

These are single-pass printers. Standard output is at 1,200dpi on all machines in this family except the AR-C260P, which prints at 600dpi. These printers can handle card stock up to 110lb. They can handle paper even bigger than standard ledger or tabloid size, at up to 12" x 18". That means you can print pages with “full bleed,” that is, with color running to the edges. The extra inch is also useful for inserting crop and fold marks outside the main printed area. That’s in addition to handling banner-size paper.

As you might expect, these machines come with both PCL and PostScript printing included. PDF printing is also allowed, but only from a Windows PC. The printers do, however, also have a Macintosh driver.

The printers come with USB, and Ethernet connectivity built-in. The network card comes with a built-in server for remote administration.

This family offers a variety of options in terms of paper supply. The AR-C240P has a 530-sheet standard paper

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supply as well as a 100-sheet bypass. You can add one 530-sheet tray for a total of 1,160 sheets. The AR-C260P has a 500-sheet standard paper supply and 250-sheet bypass, with options to add one-to-three 500-sheet trays, or one 3,000-sheet tray for a total paper capacity of 6,750 sheets. The AR-C265P has a 300-sheet standard supply and 100-sheet bypass with an option to add a 530-sheet tray.

Paper capacity is a strong point of the AR-C360P, which starts with a 230-sheet bypass tray. There's a 300-sheet tray as well. Automatic duplexing is also a standard feature on the AR-C360P, and optional on the AR-C240P, AR-C260P, and AR-C265P.

Basic output for the AR-C360P is a 500-sheet exit tray. This unit also comes with an optional finisher with saddle stitching ($3,095) and a 2/3-hole punch ($695 list). The finisher can staple up to 50 sheets at a time and holds up to 1,000 sheets in total. A saddle-stitching finisher with three-position stapling, as well as a hole-punch unit, is available for the AR-C260P. The more basic AR-C240P and AR-C265P don't offer finishing options.

You can certainly buy a color printer for less. But you will find few printers that can offer such professional quality and flexibility.

Chart entries — pages 115–116

TallyGenicom

Chantilly, VA
800 436 4266
www.tallygenicom.com

Vendor Profile

A few years ago, printer manufacturer Genicom merged with Tally Corporation, another printer maker. The new company is called TallyGenicom, and the printer sales operations have been combined.

The company also offers electronic forms software, which merges data with pre-designed forms to make report generation faster and easier.

TallyGenicom sells a variety of mostly heavy-duty and specialized printers using several different technologies, including dot matrix, ink jet, and laser.

TallyGenicom sells direct and through dealers. It tends to target vertical markets such as government, banking, and engineering. It also sells internationally.

www.betterbuys.com

Product Profiles

TallyGenicom 8008

8ppm full color
31ppm black & white

Sum-up: Good black printing speed but otherwise basic features.

This model is TallyGenicom's attempt to get into the low-cost color laser market. And it's a pretty good machine. Its list price is $775, so we assume that you may be able to buy it for somewhere around $600 or $650.

The printing speed is pretty good: 8ppm in color and 31ppm in black. Until just recently that would have been an excellent color speed for the low-cost color laser market. Unfortunately for TallyGenicom, companies like Lexmark, HP, and OKI Printing Solutions have come into the market with higher color speeds. Nevertheless, the black printing speed is quite impressive and the color speed is not that slow, especially for companies that need only occasional use of color prints.

The processor runs at 170MHz, slower than most other color printers on the market. Memory is limited to 64MB, not as big a deal since PostScript is not offered. Ethernet is standard.

In terms of paper supply, the 8008 starts with 250 sheets. That can be upgraded with a 500-sheet drawer. Duplexing is an option. The output is limited to 250 sheets.

TallyGenicom T80O8
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$95.00	10,000	$ 0.010	$ 0.010
Cyan toner	$165.00	6,600	$ 0.025	N/A
Magenta toner	$165.00	6,600	$ 0.025	N/A
Yellow toner	$165.00	6,600	$ 0.025	N/A
Drum/4-color	$240.00	60,000	$ 0.004	$ 0.004
Waste toner bottle	$4.20	12,000	$ 0.000	$ 0.000
TOTAL PER-PAGE COSTS			$ 0.0889	$ 0.0139
			8.89	1.39

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Costs per page are quite good: 8.9¢ for a color page and 1.4¢ for black. Those costs are very impressive for a low-cost printer and makes this machine worthy of a second look.

This is a decent printer, but while it would have been a strong competitor a year ago, it has now been outgunned by newer introductions. The consumables costs alone might make this a very good buy if you are interested in a small workgroup printer.

Chart entry — page 116

TallyGenicom 8026

26ppm full color
36ppm black & white

Sum-up: Very good speed on a proven platform.

The TallyGenicom 8026 is a fast color laser printer that offers 26ppm speed in color and 36ppm speed in black-and-white. It has a street price of $999. It is based on the same Fuji Xerox engine as the Konica Minolta magicolor 3300 family, which sells for considerably less.

The unit comes with 128MB of memory and you can upgrade it to 256MB. It is powered by a 533MHz processor. PostScript is a standard feature. Ethernet and USB connectivity are standard.

Like many other color printers, this one has a 150-sheet bypass and a 500-sheet paper tray. You can add up to two more 550-sheet paper trays or a 1,500-sheet tray. The bypass handles heavy stock paper. Output consists of a single 250-sheet tray.

TallyGenicom T8026N
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.00	8,500	$ 0.012	$ 0.012
Cyan toner	$154.00	6,000	$ 0.026	N/A
Magenta toner	$154.00	6,000	$ 0.026	N/A
Yellow toner	$154.00	6,000	$ 0.026	N/A
Drum/4-color	$349.00	30,000	$ 0.012	$ 0.012
TOTAL PER-PAGE COSTS			$ 0.1003	$ 0.0233
			10.03	2.33

Price per page is 10¢ for color and around 2.3¢ for black-and-white. Those are quite good prices, so you may want to figure out if you run high-enough volumes to overcome the high sticker price for the printer itself.

This is a good enough model, but it has a lot of competition in its range, most notably Xerox Phaser 7300, based on a newer and faster version of the same engine. The 8026 deserves a look, and should do well in TallyGenicom's government-oriented channels.

Chart entry — page 117

TOSHIBA

Irvine, CA
949 583 3000
www.toshiba.com

Vendor Profile

Toshiba, a huge Japanese electronics company, is a relatively small player in the office equipment market. Toshiba makes fax machines and copiers, and has recently entered the color laser printer market. Its current models are relabeled versions of Lexmark color printers, including one that has recently been discontinued by Lexmark. Toshiba's partnership with Lexmark is part of a strategy to offer a broader range of devices to its customers, which is especially important when it comes to bidding on large multi-machine deals. Toshiba has introduced relabeled versions of Lexmark's monochrome laser printers as well. Note that Toshiba prices for machines and options are list. They tend to have prices similar to Lexmark equivalents, but you'll have to negotiate consumables with your dealer. All Toshiba models come with Ethernet included. You can add duplexers, memory, and paper trays to match other Lexmark models in the respective families.

Product Profiles

Toshiba e-STUDIO205CP

20ppm full color
20ppm black & white
Same Machine as the discontinued Lexmark C524dn

Chart entry — page 117

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Toshiba e-STUDIO360 CP
32ppm full color
36ppm black & white
Same Machine as the Lexmark C920
Chart entry — page 117

UNISYS

Blue Bell, PA
800 874 8647
www.unisysdirect.com

Vendor Profile

Unisys is best known as a manufacturer of mainframe computers, especially for large institutions such as government, banking, and insurance companies. As such, it is IBM's only real competitor, though definitely a distant second. In recent years, Unisys, like IBM, has concentrated on selling services rather than hardware. It has become expert at configuring and maintaining computer systems for widely distributed corporate and governmental clients.

Unisys adopted this series of laser printers from Lexmark and has relabeled them. These models are sold through Unisys's direct-sales organization and also on the Internet. It's unlikely that anyone other than a Unisys customer would buy one, but they are available for anyone. Note that Unisys has a slightly higher price and carries the networked version only.

Product Profile

Unisys UDS 579-DN1
25ppm full color
25ppm black & white
Same Machine as the Lexmark C770n (duplex version)
Chart entry — page 118

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XANTÉ

Mobile, AL
800 926 8839
www.xante.com

Vendor Profile

Xanté Corporation specializes in prepress equipment and printers for the graphics industry. It sells monochrome and color laser printers as well as specialized printers for such media as printing plates, film, and heavy stock.

Xanté has consolidated its color laser printing line, replacing its CL30 family of printers with its Ilumina machine. As with its previous printers, Xanté emphasizes color quality with the Ilumina, making tools available for creating accurate and consistent color and for proofing pages destined for the printing press.

Xanté was founded in the late 1980s by former employees of QMS, another printer vendor in Mobile, Alabama, that is now a division of Konica Minolta. Xanté sells its printers direct and through resellers.

Product Profiles

Xanté Ilumina
36ppm full color
40ppm black & white

Sum-up: Speedy, feature-rich ledger-size model prints on a variety of media.

Having discontinued its CL30 family, Xanté's sole color laser offering at present is the $6,495 Ilumina tabloid printer, which offers 36ppm printing in color and 40ppm in black-and-white, and prints at 1,200 x 600dpi resolution.

The single-pass Ilumina comes with 512MB of memory that can be upgraded to 1GB. It has a powerful 720MHz processor. PostScript and PCL are standard, and the machine has Ethernet, parallel, and USB connectivity standard.

The Ilumina's main selling point is its paper-handling versatility. It can print on up to 24pt. cover stock on up to 12.9" x 47.24" sheets. Besides conventional paper print jobs, the Ilumina can print 4-color business cards, postcards, brochures, banners, and signs.

This machine has impressive paper capacity. It comes with a standard 530-sheet tray. You can put up to five

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Xanté Ilumina Consumables costs at-a-glance	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.99	15,000	$ 0.007	$ 0.007
Cyan toner	$290.00	15,000	$ 0.019	N/A
Magenta toner	$290.00	15,000	$ 0.019	N/A
Yellow toner	$290.00	15,000	$ 0.019	N/A
Drum/black	$155.99	39,000	$ 0.004	$ 0.004
Drums (3)/3-color	$573.00	39,000	$ 0.015	N/A
Fuser roller	$296.00	80,000	$ 0.004	$ 0.004
TOTAL PER-PAGE COSTS			$ 0.0871	$ 0.0144
			8.71	1.44

530-sheet paper trays in this unit, added to a 230-sheet bypass, for a total of 2,880 sheets. You can also add a 1,590 high-capacity tray for a total of 2,350 sheets of capacity. Duplexing is standard. It has a 530-sheet standard output tray.

The Ilumina is a workhorse, with a 150,000-page monthly duty cycle. According to Xanté, it can print 2,000 sheets an hour.

Consumables costs are pretty attractive for the color market, at 1.4¢ for black-and-white and 8.7¢ for color.

Xanté offers software tools for managing jobs through writing ready-to-print jobs like forms to the hard disk, printing PDF files, and secure printing. The company's ColourMatch 2 software allows you to get accurate color results from scanned materials. Automatic color calibration keeps the printer colors consistent. All in all, Xanté offers a nice set of features.

This Xanté printer looks like a very solid model, with lots of power. One problem, however, may be pricing. While the list price is high, the actual street price is not certain. Unfortunately for Xanté, buyers might feel more comfortable with a comparable model from better-known companies like OKI Printing Solutions and Xerox. However, it makes sense to compare those companies' prices with one that a Xanté dealer might offer you.

Chart entry — page 118

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XEROX

Wilsonville, OR
503 682 7377
www.officeprinting.xerox.com

Vendor Profile

Xerox contends for leadership in the color laser printer market with Hewlett-Packard. Xerox is proud of its color printer line, and with good reason: the company offers a variety of very good workgroup printers.

Xerox became a player in color printing with its purchase of Tektronix's printing business, which was completed early in 2000. Tektronix (Tek) was a color printer specialist whose smart product development and marketing strategies won it a first-class reputation. But Tek, as a specialist vendor, lacked the size and financial muscle to compete successfully with market giant Hewlett-Packard (HP).

As a result of the acquisition, Xerox got an unmatched range of color printer models, as well as access to Tek's unique solid ink jet technology. Note that the company also markets a series of production-level color printers, which are not covered in this guide.

Xerox dropped the Tektronix brand name. (There is still an independent Tektronix company, which sells electronic testing and measurement equipment.) It has, however, held on to the Phaser brand.

There is a pattern to Xerox product development that is not apparent from the printer names. Xerox has focused on a strategy of offering three color technologies: laser, LED, and solid ink jet. This makes their printers suitable for a wide range of requirements.

Note that all Xerox units are sold with Xerox's Total Satisfaction Guarantee. With that warranty, if you are not satisfied with any Xerox equipment you buy from Xerox or its participating dealers and retailers, they will replace it without charge with an identical model or, at the option of Xerox, with a machine with comparable features and capabilities. That's a nice plus, and one that's not matched by other vendors.

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Product Profiles

Xerox Phaser 6120N

5ppm full color
20ppm black & white

Sum-up: An entry-level model with basic features and a very low price.

The Phaser 6120N model, which replaces the Phaser 6100 family (though based on a different engine), allows Xerox to offer a low-cost color laser solution. The model offers unspectacular basic features, but it has a low base price of $499 ($299 after Xerox's current $200 rebate).

The 6120N prints at 5ppm in color and 20ppm in black-and-white. It has 128MB of standard memory, which you can upgrade to 640MB. That may be a good idea if you run complex jobs in PostScript, a nice plus for a low-level printer. The processor is reasonably fast at 300MHz. Xerox sets its monthly volume as 35,000 pages, which is far more of a workout than this machine is likely to get.

Paper supplies consist of a 200-sheet paper tray. You can add an optional 500-sheet tray. Output is limited to 200 sheets. That's not much, but it is comparable to most other low-cost color lasers. Ethernet and USB are standard. There's a third-party Wi-Fi option. These are features that go beyond the minimum.

As with all inexpensive color laser printers, we suspect you'll make up for the bargain by spending more on toner. The per-page price for black is 3¢, while color pages cost 14.6¢.

This model is intended to keep Xerox in the running from the bottom to the top of the color laser printer market. That's all for the best for consumers, and we think that this is one of the better bargains at the low end.

Chart entry — page 118

Xerox Phaser 6120N
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.99	4,500	$ 0.022	$ 0.022
Cyan toner	$159.99	4,500	$ 0.036	N/A
Magenta toner	$159.99	4,500	$ 0.036	N/A
Yellow toner	$159.99	4,500	$ 0.036	N/A
Imaging unit/4-color	$169.99	10,000	$ 0.017	$ 0.008
TOTAL PER-PAGE COSTS			$ 0.1459	$ 0.0302
			14.59	3.02

Xerox Phaser 8500N
Xerox Phaser 8500DN

24ppm full color
24ppm black & white

Xerox Phaser 8550DP
Xerox Phaser 8550DT
Xerox Phaser 8550DX

30ppm full color
30ppm black & white

Sum-up: A speedy update to a unique printer series that remains a good buy.

The Phaser 8500/8550 family is the latest product offering in an evolving line of solid ink printers. That engine technology was originated by Tektronix, whose printer division was taken over by Xerox in 1999. Solid ink printers (Xerox is the only company selling office printers with this technology) have little to do with the more common, inexpensive thermal ink jet printers of the small or home office. Instead, solid ink is a technology in office printing competing with laser and LED machines. We consider it a laser-class technology, and it compares favorably with standard color lasers.

Solid ink printers offer what we consider to be excellent image quality. It used to be the case that these machines were almost too vivid for their own good, so that printed photos were not true to color. But Xerox color scientists have upgraded the ink technology so now photos look closer to the original. Even the default settings seem to produce pretty accurate color renderings, though this printer technology is not intended for those who need exact color matching (unlike, say, Xerox's own Phaser 7760 series).

It must be said that these printers run relatively slow at the maximum resolution photo mode speed, with a standard resolution of around 300 x 400dpi more likely for normal work. As we have said, resolution is not the biggest issue when dealing with color quality, especially given the way a solid ink jet prints. On the other hand, if you demand extremely crisp black-and-white type, you'll have to run at higher than the standard resolution.

This generation of solid ink printers offers very respectable speeds. The 8500 engines are rated for up to 24ppm, both in color and in black-and-white. The 8550

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models are rated at 30ppm. Numbers don't tell the complete story here — 24ppm or 30ppm are achieved in the "fast color" mode, which is 225 x 400dpi. The default mode is "enhanced" mode, which is 1,200dpi interpolated. On the 8500 printers, that runs at 12ppm, half the speed of fast mode. On the 8550 models, enhanced mode runs at 16ppm.

In addition, the Phaser 8550 models have two other modes. The "standard" mode prints at 300 x 450dpi at a speed of 24ppm. The "photo mode" has an interpolated resolution of 2,400dpi and prints at 10ppm.

You select a printing mode (other than the default) as an option in the print dialog box. Because solid ink technology is so different from toner, it is hard to make exact comparisons between these resolutions and those of other color printers in this guide. To our eyes, the enhanced mode is also quite acceptable for all office work and the faster speeds are totally acceptable for drafts, memos, and most other internal documents.

The standard resolution sounds low compared with the 1,200dpi claimed by some rivals, but we find that the resolution is totally acceptable, even in standard mode. This high quality at seemingly low resolution may be due to the difference between laser and solid ink, so that direct comparisons of resolution aren't possible.

In any case, while photo-quality printing is not very fast, it runs circles around the real-life photo printing speeds on most regular (liquid) ink jet printers.

These models come with powerful 600MHz processors, ensuring that they will handle images fast enough to keep the engine cranking out pages. Indeed, this printer series is very respectable for everyday black-and-white office printing as well.

The Phaser 8500/8550 printers are also very easy to use. For example, when you have to change consumables, you need only open the top cover of the machine and slide in blocks of ink that look and feel like disk-shaped crayons. A Phaser printer melts those "crayons" and sprays the melted extract onto the paper.

You can't even make a mistake, as each of the four colors has a unique shape that only fits in the appropriate slot. Replacing supplies on color printers can be a daunting task, but not on these models.

Per-page prices fall in the midrange, though a small difference in the capacity of the maintenance kit makes for a notable difference between the 8500 and the 8550 models. For the 8500, an average page costs 11.3¢ in color, which is above average, and 2.5¢ for black-and-white, which is a little high for similar color printers. For the 8550, prices are much more competitive: 10.8¢ for color, 1.95¢ for black-and-white.

Versions: There are two 24ppm Phaser 8500 models and three 30ppm Phaser 8550 models. All of them come with both USB and Ethernet ports. They are:

- The Phaser 8500N (street price $899), which comes with 128MB of memory, upgradeable to 512MB.
- The Phaser 8500DN (street price $1,099), which adds duplexing.
- The Phaser 8550DP (at $1,299), a faster model that has 256MB of memory upgradeable to 1GB. It also offers an optional 20GB hard disk.
- The Phaser 8550DT (at $1,599), which comes with a second 525-sheet paper tray standard.
- The Phaser 8550DX (at $2,399), with 512MB of memory upgradeable to 1GB, a standard 20GB hard disk, and a third standard 525-sheet input tray.

Each model starts with at least a 100-sheet bypass and a 525-sheet standard paper tray. A second and a third 525-sheet paper tray are available (optional on the lower-end models). The maximum input capacity for the models is 1,675 sheets. The bypass can handle up to 110lb. card stock, quite unusual in this price range. Output capacity is based on a simple 300-sheet tray.

PostScript and PCL are standard features. USB and parallel connectivity are standard as well.

When it comes to pricing, the Phaser 8500/8550 series is very competitive with its laser and LED counterparts at the low end of the midrange level of the market. But the

Xerox Phaser 8500
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$88.99	6,000	$ 0.015	$ 0.015
Cyan toner	$88.99	3,000	$ 0.030	N/A
Magenta toner	$88.99	3,000	$ 0.030	N/A
Yellow toner	$88.99	3,000	$ 0.030	N/A
Maintenance kit	$149.99	30,000	$ 0.005	$ 0.005
TOTAL PER-PAGE COSTS			$ 0.1088	$ 0.0198
			10.88	1.98

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Xerox Phaser 8550 Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$88.99	6,000	$ 0.015	$ 0.015
Cyan toner	$88.99	3,000	$ 0.030	N/A
Magenta toner	$88.99	3,000	$ 0.030	N/A
Yellow toner	$88.99	3,000	$ 0.030	N/A
Maintenance kit	$99.99	10,000	$ 0.010	$ 0.010
TOTAL PER-PAGE COSTS			$ 0.1138	$ 0.0248
			11.38	2.48

Phaser 8500/8550 family is really in a category by itself.

In another plus, these machines are small in dimension and weight, unlike some laser machines.

A fear that some users have had in the past with solid ink jets is that printed pages can be difficult to copy or scan later via a copier's automatic document feeder because of the slightly raised texture of the image. But advances in ink manufacture have minimized that problem.

Although these limitations may cause a few buyers to look elsewhere, we feel that many color users will be swayed by the Phaser 8500/8550 family's undeniable strengths.

These are not intended for really high-volume use — they are rated for 85,000 pages per month. The meager output tray is a clear indication that this printer is better suited for a moderate flow of work. The warm-up time may be an issue as well; it's considerably longer than that for LED and laser. But this should be a once-a-day issue.

These machines are capable of producing very good color output and good black-and-white documents as well. They are easy to use and can be pretty fast when it comes to full-color output, though not at the highest resolution. Keep in mind, however, that the series does not have the paper-handling capability to be used in place of a departmental laser printer.

But all things told, we really like the Phaser 8500/8550 family. We also find its attractive pricing, small and elegant footprint, and quiet operation very nice bonuses as well.

Chart entries — pages 119–120

Xerox Phaser 6300N
Xerox Phaser 6300DN
26ppm full color
36ppm black & white
Xerox Phaser 6350DP
Xerox Phaser 6350DT
Xerox Phaser 6350DX
36ppm full color
36ppm black & white

Sum-up: Raw power makes this a very good family of workgroup printers.

As with the Phaser 8500/8550 family, Xerox's Phaser 6300/6350 family has models that run at different speeds but otherwise share virtually all features and are clearly based on the same engine. In this case, that engine is a powerful one, as the 800MHz processor indicates.

The Phaser 6300 models run at 26ppm in color and 36ppm in black-and-white. The Phaser 6350 models run at 36ppm in both color and black-and-white. The 6350 models come with more standard features, but these features are optionally available in the lower-priced 6300 models. There aren't many color laser printers that offer faster speeds, especially at this price range.

The models in the series are:

- The $1,299 Phaser 6300N, which starts with 256MB of memory and 700 sheets of standard input. The monthly duty cycle is set at 100,000.

Xerox Phaser 6350 (High-Capacity Toner Cartridge) Consumables costs at-a-glance				
	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$99.99	10,000	$ 0.010	$ 0.010
Cyan toner	$249.99	10,000	$ 0.025	N/A
Magenta toner	$249.99	10,000	$ 0.025	N/A
Yellow toner	$249.99	10,000	$ 0.025	N/A
Imaging unit/4-color	$249.99	35,000	$ 0.007	$ 0.007
Transfer roller	$71.99	35,000	$ 0.002	N/A
Fuser kit	$149.99	100,000	$ 0.001	$ 0.001
TOTAL PER-PAGE COSTS			$ 0.0957	$ 0.0230
			9.57	0.02

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- The Phaser 6300DN ($1,499) adds automatic duplexing.
- The Phaser 6350DP ($1,799) has a faster color speed and a higher monthly duty cycle (120,000).
- The Phaser 6350DT ($2,549) adds a second 550-sheet paper tray for a total of 1,250 sheets of input. It also comes with 512MB of memory.
- The Phaser 6350DX ($3,149) adds a third 550-sheet tray for a total of 1,800 sheets. It also adds a standard 20GB hard disk.

All of the models can have up to one gigabyte of memory installed. A 20GB hard disk is available, standard on the DX model, optional on the others. PostScript and PCL are installed. Ethernet and USB ports are also standard.

The input system starts with a 150-sheet multipurpose tray and a 550-sheet standard tray. Other configurations are a 550-sheet paper tray or a two-drawer 1,100-sheet feeder. The maximum configuration is 1,800 sheets. The usual 250-sheet exit tray is the only output device available.

Xerox tells us that the Phaser 6300 consumables costs come in at around 2.2¢ for black and 10.8¢ for color. Phaser 6350 consumables have a high-capacity toner option, and that make costs a little lower, at 2.1¢ for black and 9.6¢ for color. These costs are about average for the industry.

The Phaser 6300/6350 models are very fast machines that have good, if basic, features and acceptable printing costs. But that's the rule in this market segment, where the Xerox models offer more speed, memory, and paper handling than its rivals. Given all those factors, they stand out as very good workgroup printers. The one thing they lack is something more than a 250-sheet output tray, but the same can be said for almost all other color laser printers under $2,000.

Nevertheless, these are excellent buys for mid-size workgroups.

Chart entries — pages 120–122

Discontinued Models?

We don't cover these "end of life" models in this volume, but they usually have been covered in previous issues. Call us at 800 247 2185 if you are interested in back issues.

Xerox Phaser 7400N
Xerox Phaser 7400DN
Xerox Phaser 7400DT
Xerox Phaser 7400DX
Xerox Phaser 7400DXF

36ppm full color
40ppm black & white

Sum-up: Very fast LED printer series built for high color quality.

The Phaser 7400 series is based on OKI's C9600/C9800 family of printers. These ledger-size models produce color pages with excellent speed. In addition, they add a number of productivity-enhancing features that make them even more useful in office environments. If you need a rugged business printer, the Phaser 7400 family is a smart choice.

Above all, it is speed that makes this series stand out. OKI Printing Solutions and Xerox have come out with a family of color printers that print at 36ppm in color and 40ppm in black-and-white. These models can act as departmental color printers. Plus, in black-and-white, they exceed most black-and-white machines.

Over the years, the big issue with LED printers has been image quality, but Xerox has worked diligently on this. In addition to the single-pass engine technology taken from OKI, Xerox has added the software-based color savvy and the toner expertise they've gained in making printers such as the Phaser 7760 family, which we consider to sit at the top of the color market. Xerox claims to have created color toners that are matched to the LED technology, allowing for finer dot size and crisper quality. In addition, the company's driver software makes it easier to achieve accurate color that approaches professional quality. These Xerox-only advances are supplemented by the OKI Printing Solutions developments, which have the machine self-recalibrating on a regular basis to ensure consistent registration.

Xerox isn't claiming this family as a rival to its 7760, which it argues has even higher image quality and recommends it for prepress proofs that will match colors on press. Nevertheless, the company does claim that it can deliver superior accuracy and vibrancy, more than a match for most laser printers.

The Phaser 7400 family comes in five models:

- The Phaser 7400N ($2,999 street), which includes 800 sheets of input and 256MB of memory and prints at 1,200dpi

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- The Phaser 7400DN ($3,349), which adds automatic duplexing
- The Phaser 7400DT ($4,599), which has 512MB of standard memory and a 40GB hard disk, and adds a second 550-sheet paper input drawer for a total of 1,350 sheets
- The Phaser 7400DX ($5,499), which adds a 1,650-sheet high-capacity paper feeder for a total of 2,450 sheets
- The Phaser 7400DXF ($7,999), which adds an 1,100-sheet finisher

All of these models have other strong features. They have speedy 800MHz processors and come standard with both Ethernet and USB connectors. They also support PCL and PostScript printing. And they all have a rated duty cycle of 150,000 pages per month. Like most printers in this guide, they can be managed remotely over the Internet.

The one-year on-site warranty is typical, and Xerox adds its own excellent Total Satisfaction Guarantee.

All five models can output color pages at up to 36ppm and black-and-white pages at 40ppm. They print at 1,200dpi, with the exception of the base model, and they run at full speed at the highest resolution.

Standard memory comes in at 256MB on the two lower-end models and 512MB on the rest. In any case, this can be expanded to a full gigabyte. Added memory can make a big difference in a busy office where print jobs back up, especially when they are large color jobs. It also is a help in mopying or collating large documents.

The Phaser 7400DT, DX, and DXF models come with a 40GB hard disk. This can be used to store frequently run images or jobs. Most important, this makes it easy to print complex jobs involving electronic collation, where the printer prints an entire document, in sequence, over and over. 40GB is, by printer standards, a decent hard-disk capacity.

The 800MHz processors in these machines are among the fastest in the printing industry. It's hard to tell how much processor speeds matter in this market, since printing speeds are also limited by the physical elements of the printer. However, it's always nice to have more speed.

The Phaser 7400's paper handling is quite good. It can handle ledger and tabloid-size paper, if that's your requirement, along with legal- and letter-size pages. The lower-end models, the Phaser 7400N and 7400DN, have an 800-sheet standard paper capacity, which is based on a 550-sheet paper tray (a little better than the usual 500-sheet tray) and a 250-sheet multipurpose tray (letter-size sheets only). But you can build from there, by adding one 550-sheet paper tray. The top-end model also gives you a 1,650-sheet high-capacity feeder, with a potential maximum of 3,000 sheets. That's pretty good, and few models do much better.

Xerox Phaser 7400
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$134.99	15,000	$ 0.009	$ 0.009
Cyan toner	$324.99	18,000	$ 0.018	N/A
Magenta toner	$324.99	18,000	$ 0.018	N/A
Yellow toner	$324.99	18,000	$ 0.018	N/A
Imaging unit/black	$139.99	30,000	$ 0.005	$ 0.005
Imaging unit/cyan	$199.99	30,000	$ 0.007	N/A
Imaging unit/magenta	$199.99	30,000	$ 0.007	N/A
Imaging unit/yellow	$199.99	30,000	$ 0.007	N/A
Waste toner box	$25.99	30,000	$ 0.001	$ 0.001
Fuser kit	$199.99	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0907	$ 0.0145
			9.07	1.45

Output capacity, however, is a disappointment. There are only 600 sheets of output on the 7400N, and 750 sheets of output on the other machines in this family. Given the throughput these machines will generate and the good input capacities, we find the lack of larger output options may be a problem in some offices.

Color pages print at a below average cost of 9.1¢, while black-and-white costs are excellent for a color printer at 1.5¢.

We believe that in terms of performance and features, these are good printers. They are among the lowest-priced color printers that can handle 11" x 17" paper. They make most sense in office environments where you need both monochrome and color capability. Improvements in quality are fully appreciated, but this machine is not intended for the most demanding graphics tasks.

These Xerox printers come in at prices below their OKI Printing Solutions cousins. They offer a good set of features for the price, and the reasonable output costs are pretty good as well. If you want even more, you might also look at the more expensive Xerox Phaser 7760 families.

Chart entries — pages 122–123

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Xerox Phaser 7760DN
Xerox Phaser 7760DX
Xerox Phaser 7760GX

35ppm full color
45ppm black & white

EDITOR'S CHOICE 2007

Sum-up: A leader in quality laser color reproduction and a fast ledger-size printer series to boot.

The new Phaser 7760 is a ledger-size color printer series that is an upgrade to the Phaser 7750, a powerhouse that can meet very demanding requirements. It is one of the fastest office color printers, and can surpass most other models for speed and image quality. The Phaser 7760 prints at 35ppm in color and 45ppm in black-and-white. In addition, that speed is combined with excellent quality.

Overview: The Phaser 7760 family has some nice features. It supports printing of up to 12" x 18" paper sizes, and it has excellent image quality, lots of memory, and strong paper handling. The standard models have a Fuji Xerox engine with a powerful 800MHz processor.

The Phaser 7760 has a standard 40GB hard drive in all models. The hard drive supports electronic collation of complex multipage documents. In addition, the Phaser 7760 models can accommodate up to 2,150 sheets of paper capacity, though the different models come with different standard paper capacities.

All three models have a generous 512MB. This can be expanded to 1GB with options. All come with USB and Ethernet connectivity as standard features and support PostScript 3. The machines print at 1,200dpi.

The Phaser 7760 also offers a feature that's now common on upscale color printers — a Web-based printer management program that allows you to check printer status remotely using the browser on your computer. The Xerox name for this software is CentreWare. Xerox also touts something called Intelligent Ready software, which can minimize printer warm-up time.

As with other Xerox products, this family has a one-year warranty plus Xerox's Total Satisfaction Guarantee.

There are three models in the Phaser 7760 family:

- The 7760DN is the base model (street price $6,299), which comes with 650 sheets of input, a hard disk, standard Ethernet, and standard automatic duplex.
- The 7760GX ($7,399), which has 2,150 sheets of standard input and adds Xerox's PhaserMatch color-matching software standard (available as an option for the 7760DN).
- The 7760DX ($7,699), identical to the 7760GX, but with 3,150 sheets of standard input.

All of these units offer some standard Xerox color features, including secure print, job pipelining and compression, and usage and analysis tools. PostScript 3 and PCL 5c are standard as well.

Output devices: These units all come standard with a 400-sheet offset catch tray. You can also add a 3,500-sheet-capacity finisher that offers multiposition stapling of up to 50 sheets and 3-hole punch, or a 2,500-sheet capacity booklet maker with stapling and 3-hole punch. While this is not the widest range of output options in the color printer market, it's not too bad.

These printers are rated for 150,000 pages per month, meaning they are designed to be serious workhorses.

Image quality: Xerox provides an impressive array of tools for maintaining color calibration and color matching with this printer family. These include such items as Pantone certification, sRGB color matching, ICC profiling, and their own TekColor Dynamic Color Correction. The aforementioned PhaserMatch software allows you to create color proofs that match as closely as possible the look of the same page printed on an offset press or other output device on a range of paper types from newsprint to high-gloss. These capabilities are not very useful for the typical office user, but they answer a major requirement for the design/graphic arts group that needs precise color matching.

The printer also allows you to print in photographic mode and produces photo-like quality (though you sacri-

Xerox Phaser 7760
Consumables costs at-a-glance

	Price	Yield	Full-color cost per page	Black-and-white cost per page
Black toner	$129.99	32,000	$ 0.004	$ 0.004
Cyan toner	$324.99	25,000	$ 0.013	N/A
Magenta toner	$324.99	25,000	$ 0.013	N/A
Yellow toner	$324.99	25,000	$ 0.013	N/A
Imaging unit/4-color	$329.99	35,000	$ 0.009	$ 0.009
Waste toner box	$19.99	27,000	$ 0.001	$ 0.001
Fuser kit	$199.99	100,000	$ 0.002	$ 0.002
TOTAL PER-PAGE COSTS			$ 0.0552	$ 0.0142
			5.52	1.42

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fice a little on text quality in this mode). These features suggest that the Phaser 7760 is well suited for use on graphic arts color printing and able to perform as an office printer as well.

Operating costs: Operating costs on the Phaser 7760 are quite good. The cost for a black-and-white page is around 1.4¢, a little less than most color printers. The color price per page is around 5.5¢. That's better than most models in the color printer market.

Conclusion: We believe this is a terrific multipurpose printer family. The machines are able to perform as office printers as well as superb graphic arts printers. The cost of operation is good, and the input and output options are above average. We're also impressed by the image quality we've seen from this printer series. Its biggest challenges on the graphics front is the Sharp AR-C360P, which do quite well in color quality, too. The Ricoh family has a lower cost per page and matches up well in terms of input and output, while the Sharp model offers comparable performance for about half the price. The Phaser 7760 models are not cheap, though they are economical to run. If your needs match their strengths, they're an excellent solution. They get our Editor's Choice Award.

Chart entries — page 124

Coming Soon....

The Color Copier Guide
Full-color copiers that can also double as upscale color printers. Prices from $2,000 to and higher.

The Office Laser Printer Guide
Black-and-white laser printers that run at up to 49ppm. These machines can be either personal, workgroup, or departmental models.

The Laser Fax Guide
Covers laser plain-paper faxes, many of which also have low-end multifunctional capabilities.

The Printer Multifunctional Guide
Small-office multifunctionals and multifunctional office printers that print at up to 50ppm. These also copy, scan, and fax, and include both ink jet and laser machines that operate in black-and-white and color.

The Mid-Volume Copier & Multifunctional Guide
Black-and-white copiers and multifunctionals (copy, print, fax, and scan) that cruise at 20–49 pages per minute and support 11" x 17" — best suited for 10,000–40,000 copies per month.

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Industry Briefing

What We're Covering

This guide covers desktop printers that deliver full-color output using laser or laser-class technology. (We'll explain in a minute what we mean by "laser-class.") All the machines discussed are suitable for workgroups and can be connected to a network, often as a standard feature. We use the term "desktop" somewhat flexibly: although most of these machines will fit comfortably on a desktop, some of them sit on stands — or even directly on the floor — when fully configured. In fact, some look more like copiers than printers.

Dramatic price changes

Note that prices in this industry are in rapid change mode this year, and that many companies are either reducing prices fast or offering big rebates.

Prices have fallen significantly in recent years, and you can now get a color laser printer for as little as $299 (a few years ago, by contrast, the least expensive street price was $2,999). Most of these printers can be bought for less than $2,000, and the bulk of the 8 1/2" x 14" printers are in the $500–$2,000 segment. (Larger, 11" x 17" printers generally range from $3,000 to $7,000.)

This guide does not cover regular ink jet printers, though we should point out that the performance of a few ink jets has increased to the point that they can pose a viable alternative to laser. There's a separate section in this volume for what we call "business-class" ink jet printers, beginning on page 125.

We are, however, including in this guide a less common technology known as "solid ink jet" because it is widely viewed as being on something of a peer level with laser. This, as well as LED printing (a close cousin of laser), accounts for our use of the term "laser-class" in defining the parameters of this guide.

There's also a new technology from Ricoh, "GelSprint," which qualifies as "laser-class" color printing. According to Ricoh, GelSprint is a hybrid of laser and ink jet print technologies that offers laser-like precision and resolution with consumables costs comparable to those of laser machines. GelSprint utilizes a permanent print head that, Ricoh claims, enables fast printing by low-cost printers while contributing to their long life.

Until a few years ago, most desktop color laser printers typically had full-color engine speeds of about 3–5 pages per minute (ppm). Then there was a move toward faster models with speeds in the 6–12ppm range. Most recently, the industry has been flooded with even speedier models using so-called tandem-engine, single-pass technology, which allows for rated full-color speeds above 20ppm. (We'll explain this technology later in this section.)

Most color laser printers have been faster when printing in black only: commonly, color printers have run three or more times faster in black-and-white. This is because pages had to be run across the drum four separate times as each of the four colors was laid down.

The growing number of tandem-engine machines, however, often run at the same or similar speeds in color and in black-and-white. In addition, a new class of color printing has emerged, one that acts as a departmental, high-speed black-and-white laser, but has as an extra feature: the ability to print in color, albeit at a relatively slow speed.

The copier-printer alternative

Keep in mind that all color copiers can be connected to computers so that they double as upscale color laser printers. These machines are expensive devices, generally costing $12,000–$40,000 or more at list price once connected. Traditionally, they have offered faster speeds than desktop color printers and more sophisticated paper handling. Nevertheless, some of the latest single-function laser printers are giving the copier-printers a run for their money:

- ✔ The 20–40ppm speeds for the growing number of color laser printers rival those of most color copier-printers, which are quite a bit more expensive.
- ✔ Until a few years ago, no desktop model could print in color on 11" x 17" paper. Today, however, this ability is common.
- ✔ Until recently, desktop color printers rarely had paper trays holding more than 250 sheets. Today, most have at least 500-sheet trays as standard, and some can go up to more than 3,000 sheets.

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- ✔ Not long ago, no desktop color printer could perform automatic double-sided work. Now, however, almost all have at least an option to do so.

- ✔ In the recent past, no desktop color printer offered finishing (stapling and/or hole punching). Now a small but increasing number have them.

What this means is that people don't have to migrate upward to a color copier-printer just to get more upscale printing, even if they don't especially need the copier function — previously, by contrast, this was quite a common occurrence. However, the extent to which desktop printers are now challenging copier-based products should not be overstated: the latter are still able to offer a better combination of high performance and paper handling. But the desktop models are certainly getting closer, and the prices are remarkably lower than the copier versions.

Keep in mind also that color copier prices have fallen in response to the challenge from the printer world — with a discount, you can now get a connected, network-ready copier-based machine for about $12,000. Although this may not sound like a bargain, it is pretty low by traditional standards of this market.

We won't be talking further about the copier-printer alternative here, but you can get complete details in *The Color Copier Guide* (see back cover for ordering information). We will, however, discuss some printers with copier functionality, if they are still, first and foremost, creatures of the printer world.

What this guide offers

This guide is divided into four parts. We start with our Editor's Choice selections (page 2), which is a list of color printer models we feel provide the very best value.

Immediately afterward comes the Vendor & Product Profiles section (pages 3–56), which introduces you to the suppliers and gives our assessments of all the individual products. The Profiles section also includes charts of consumables costs for the leading color laser models; these charts give you an idea of which printers are the most economical to operate on a cost-per-page basis.

The third part of the guide — the article you're reading now — examines the state of the market, discusses technology and features, and advises briefly on how to go about buying a color laser printer. Finally, our grid-charts (pages 70–124) at the back of the guide provide an at-a-glance comparison of features and pricing of all models covered in the guide.

What we are assuming

Keep in mind that we will not be spending much time in this article explaining printer terms and concepts that are not color-specific but apply equally to regular black-only models. So if you have very little technical grasp of printers — for example, if you don't really understand what's meant by the word "PostScript" — you may want to refer to the separate Better Buys guide on black-and-white office laser printers (see back cover). As well as focusing on black-only models, that guide serves as a printer primer in general.

Nevertheless, we will be reminding you about a few printer basics in this article, so what follows should be reasonably easy to understand if you consider yourself moderately printer-proficient.

The State of Office Color

Desktop color lasers aimed at non-specialized users have been around for more than a dozen years. The market dates back to 1993, when QMS (now part of Konica Minolta) introduced a landmark machine priced at $12,500; color lasers had previously cost over $20,000. Today, a good printer can cost less than $2,000, and — with a growing number of entry-level models priced under $1,000 — the machines are becoming more affordable every year. Operating costs have also fallen, making the price of using these machines less prohibitive than was once the case (more on this later).

The main priority in vendors' product development strategies is to continue getting the price down, as it is cost — more than any other factor — that has so far kept these machines in something of a niche. As the prices have continued to plunge below $1,000, color laser printers have become attractive to a broader audience, possibly taking the place of some black-and-white models.

Overcoming objections

However, any widespread move to introduce color into mainstream business documents will run up against two objections.

The main roadblock is that even if you put aside the cost of buying the machine, full-color pages will always have higher consumables costs than black-and-white ones. Urging corporate America to switch to color is akin to asking it to raise its hard-copy operating costs by a factor of four or more.

Vendors never tire of pointing out the commercial benefits of color — making sales proposals more hard-hitting, for example — but these gains are harder to quantify than the costs. And there is also a hidden cost that

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many people overlook — namely, the time it takes for computer users to apply color to documents in the first place. There is also an undeniable element of waste — the trivial, unnecessary, and often non-work-related uses to which color can be put once it is made available to everyone in the office.

The second objection has been one of speed — no matter how fast vendors made color machines, black-and-white ones were usually faster. This relationship was due to mainstream color laser technology, which lays down black-and-white four times as fast as it does full-color images. Under that scheme of things, vendors were asking buyers to wait longer for their work, as well as to pay more for it.

But speed objections have pretty much vanished. Printers using single-pass tandem technology are able to print color as fast, or almost as fast, as they do black-and-white. As a result, color speeds are very fast by historical standards, and their black-only speeds are also quite acceptable.

To be sure, cost will continue to limit the use of color in the office for some time. But as vendors develop printers that are good for both color and black-only printing, they are overcoming these limitations. A likely vision for the office of the future is one where most printers are capable of color but are not always used for that purpose.

The twin-missions concept

As we've explained, manufacturers are now offering a number of models that are designed to more adequately meet the twin missions of catering to both plain-vanilla black-and-white work and color printing needs.

A number of models now have black-only speeds over 15ppm, even up to 28ppm or 38ppm. That's a significant number given that, until very recently, 25ppm defined the high end of mainstream network black-and-white printing (that barrier has lately shifted to 35ppm or 45ppm, but 25ppm still marks the start of "fast" workgroup and departmental printing).

And whereas black-only consumables costs on color-capable machines were previously at least double those of regular monochrome laser printers, today the cost of printing in black on a color machine can be more reasonable (more on this later when we talk about operating costs).

A network-ready color laser that's able to print in black at 30ppm (like the $999 HP Color LaserJet 3000) is effectively giving you the performance of a 30ppm dedicated black-only printer costing $550 (like the HP LaserJet 2420). And it adds 15ppm color printing. What this means is that the cost of adding color to your workgroup printer is, in this case, about $450.

This, of course, presupposes that you need (another) black-and-white printer. And the key to growing this market is persuading people to buy color instead of black-only when they need new printers rather than asking them to go out and buy specialized printers in addition to the ones they have.

Under this scenario, people in an office would have access to color when they need it but would be able to print in black-and-white when speed and cost are more important than appearance. What's more, color would often be used only in a limited way — to highlight headlines, for example — rather than to print the endless photos and full-color business graphics that tend to be featured so heavily in printer vendors' samples.

Still, vendors have some way to go before they can really deliver color printers that also fulfill a no-compromises monochrome mission. Typically, color printers are far bulkier than black-only ones. And even when engine speeds are similar, paper-handling capabilities are generally more limited on comparable-speed color printers.

Speed and product differentiation

While price is still the number one priority in manufacturers' development plans, speeds are still improving, as is the price/performance ratio. As stated earlier, entry-level and midmarket models once had top color speeds of only 4ppm. These days, however, it's more common to see new models with top color speeds of 12ppm, 20ppm, or even 30ppm+.

Keep in mind that the engine speed is that which the machine is guaranteed not to exceed — not that which it is promised to reach on every job. The actual performance you get out of a printer also depends on the ability of the printer's built-in controller to process the types of jobs you send and the amount of memory installed. Also, it is the speed for printing letter-size pages, even if it is the speed rating for a printer that handles ledger-size output. In any case, the rated speed for laser-class printers will correspond much more closely to actual performance than will rated speeds for color ink jet models.

Another trend in the last year or so is that most vendors are marketing more than one desktop color laser printer, whereas previously most concentrated on a single model. Most often, there are two basic models for most vendors — one that prints on letter- and legal-size paper and one that will do ledger-size printing. To some extent, the smaller size corresponds to "business color" applications and the larger size to more graphics-intensive uses. However, as the sales of color printers grow, more and more vendors are offering models with a range of speeds and a selection of imaging technologies.

Image quality

Whenever vendors come out with new models, they pro-

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claim "breakthrough" image quality. The reality, however, is that image quality has reached something of a plateau, and the latest machines aren't, as a rule, vastly different in this respect from those of a year or two earlier. Price, speed, and features, more than quality, are what have changed.

We see the market in terms of three levels of color image quality. They are:

- Business color, which could also be called "good enough" color, means that the color used on company logos, charts, diagrams, and other graphics looks fairly close to the color intended by the author. However, it is not entirely perfect. This is typical of LED printers and most low-end color laser printers. The key issue is color consistency, so that color doesn't vary from one print to another during a run.

- Photographic color, where the images (whether photographs or simple documents) go through a process that makes the color output glossy. This kind of color is provided by solid ink jet printers and some laser printers, especially those with improved toner that can print on glossy paper stock or specialty paper sold by the manufacturer. Note that this look is not directly related to higher resolution.

- Professional color, for designers and graphic artists preparing high-value documents or other work (such as covers, folders, and packaging) that will later be sent to commercial printers. This level of image quality accurately portrays the colors that will be printed on the final product by the commercial printer. High-end color laser printers with color calibration and color-matching software are able to produce this type of color quality, though even here the user may have to work at getting the right settings.

The lines drawn between the various color-quality categories are not absolute, of course. And some printers can serve more than one purpose. But it's important to assess your color needs before you go out and buy a new machine.

On-demand color printing

Although the most obvious use for color printers may be to spruce up the documents you currently produce in black-and-white, these machines can also offer an alternative in some cases to commercial printing. Instead of having color brochures produced by a firm of commercial printers using offset printing equipment, you could instead start producing them on a "just-in-time" basis on your own laser machine.

However, the per-page cost of an on-demand color laser print is normally higher than that of commercial offset printing, especially when it comes to printing longer runs. However, if you need to produce 50 or 100 copies of a flyer or postcard, a color laser printer will be a bargain.

On-demand printing using a laser printer also allows you to avoid the storage costs and waste typically associated with producing long runs of promotional literature. You can also keep your materials up-to-date, and you can personalize them to the needs of recipients. The quality of the color and the paper may create a different look and feel from what you may be used to with offset printing, however. While this method of output may be good for things like price lists, it has its limitations.

We should also mention a class of machine that falls somewhere between desktop color printing and offset printing. These machines include the digital press from Indigo (now owned by Hewlett-Packard) and production-level color printers from Xerox and Kodak (not within the scope of this guide). There are also the very fast color copier-printers from Canon, Konica Minolta, and Xerox. These machines fill in the gap between short runs (100 or less) and long ones (500 to 1,000 or more). In the world of on-demand color printing, the (mostly) desktop printers we cover here are relative lightweights.

Many vendors

After increasing for several years, the number of vendors in the desktop color laser printer market seems to have reached a plateau. Early in the 1990s, there were only two vendors in the market. That number multiplied by a factor of 10 over the latter half of the decade as a number of office equipment companies rushed to get into a new, fast-growing market.

Although you may see as many as 23 different brand names on color laser printers, keep in mind that some of the differences are only skin-deep. For example, Ricoh markets identical color products under the Savin, Gestetner, and Lanier brand names. Also, many vendors use other companies' engines. For example, HP uses Canon engines; Xerox uses engines from Fuji Xerox and OKI (as well as a couple of homegrown engines); and a number of other vendors use Ricoh (formerly Hitachi), OKI, Matsushita, and Fuji Xerox engines.

Do not assume, however, that two printers sold under different brand names but using the same engine are exactly the same. While they may have certain things in common, there can be important differences under the hood. The information in this guide shows which machines use what engines and highlights the important differences between models that share the same ones.

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Color Fundamentals

Let's focus next on some of the main technical and performance issues that crop up in any discussion of color printers.

Laser basics

As with monochrome machines, color laser printers work by having a light source etch an image onto a photosensitive drum that then attracts toner; the toner is transferred to paper, heated, and fused; and an image is created. The difference is that with monochrome lasers, the process is completed with one pass through the machine, but with older color models, the imaging (at least traditionally) takes place a total of four times — one for each of the four process colors from which all composite colors are formed. This explains why color print speeds have typically been much slower.

But lately, the fastest models are using tandem engines featuring a one-pass process, resulting in color speeds that are the same or almost as fast as black-only ones. The engine prints the three basic printer colors — cyan, magenta, and yellow — in tandem with black, in a single pass of the paper through the imaging unit. These one-pass engines may be either laser- or LED-powered. In the past few years, this technology has almost completely taken over the industry. Only older and less expensive models offer four-pass color.

Solid ink jet: laser-class alternative

Solid ink jet technology shouldn't be confused with thermal ink jet, the much more common and less expensive variety. The image quality, full-color speed, and price of solid ink jet all place it in the laser class.

At present, Xerox is the only vendor in this guide that offers products using solid ink jet technology. (As we mentioned above, Xerox also sells color laser and LED printers.)

Solid ink jet technology relies on a solid block of ink that's melted and dropped precisely onto the paper. The ink resolidifies immediately in a process designed to maintain its clarity. Because very little ink soaks into the paper, solid ink jets deliver brighter colors than regular laser. Speeds are brisk by full-color standards.

Solid ink jets aren't fussy about what type of plain paper they print onto — they generally work fine with regular copier and laser printer paper. One benefit of the technology is that the output doesn't smudge if it gets wet. Recent developments by Xerox have diminished some earlier disadvantages of solid ink jet printing, such as a tendency to jam in copier document feeders due to added thickness and its vulnerability to scratches.

Xerox's solid ink jet machines are comparable to the less expensive color lasers. Therefore, the product positioning stresses brilliant colors, along with economy, as a reason to opt for this technology. Xerox has established a successful niche with these printers.

You may sometimes hear solid ink jets referred to as "phase change" printers, a term that refers to the melting/resolidifying process — there's no special significance to this, and the term is synonymous with "solid ink jet."

The colors themselves

All color print technologies involve mixing three or four basic colors to create millions of color combinations. You may hear of a three-color palette abbreviated "CMY," standing for cyan, magenta, and yellow. To form a composite black, CMY printers combine the three primary colors.

However, current color laser printers — including all featured in this guide — have a separate, true black (designated as "K" in printer lingo). This four-color palette is referred to as "CMYK," and it's preferable to the three-color variety: CMYK models typically generate richer-looking black text than those that combine the CMY colors to create composite black. The colors themselves come in the form of different substances, depending on the print technology — in the case of lasers, it is toner.

Keep in mind that computer monitors use a different palette — red, green, and blue (RGB) — to mix their colors. To reconcile the two color sets, some printers include color-matching software that lets users specify which monitor they have, enabling the printer to adjust the output to match the monitor.

In addition, there is a whole subindustry devoted to third-party software and hardware tools designed to control, match, and calibrate color to satisfy the pickiest people. Advanced users (especially those in the graphic arts, publishing, and design businesses) will look for "manual" controls. However, most mainstream users will be content with software that automatically optimizes color reproduction to suit the content of each page.

How important is resolution?

The best way to judge print quality is simply to look at it. If you must judge image quality by reviewing machine specifications, you should be aware that there are differing schools of thought as to what matters most. In the black-and-white market, the main reference point on a spec sheet when it comes to image quality is a printer's resolution. This is measured by the number of dots per square inch, normally noted as the number of dots per inch in a row times the number of dots in a column. For

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example 600 x 600dpi (which we call 600dpi for short) means a grid with 360,000 individual elements that the printer can place toner on.

Today, all color and black-only printers produce pages at a native resolution of at least 600dpi, and some work at 1,200dpi. It is widely felt that higher numbers mean better quality. And whether or not you agree with this, it seems inevitable that the dpi resolution figure will always be the most "visible" specification by which printers are judged on paper because it attempts to boil down several complex elements to a single value.

However, most vendors have their own versions of interpolated resolutions, meaning a manipulation of the output to give it the appearance of higher resolution. Some vendors seem to have better software for this than others. Some have better toner quality that allows for finer apparent resolution. It's all very confusing. For example, HP has come up with a heavily patented technology called ImageREt 2400 that supposedly delivers 2,400dpi-grade results from a 600dpi engine.

Caught in the crossfire of competing technical claims, the conclusion we draw is that there is no single magic formula for designing color printers that deliver fine results — different paths can lead to the same destination. A higher resolution can be helpful, but it is not the be-all and end-all of everything. In commercial printing, for example, resolution is considered more important for text than for reproducing photographic images. And don't forget that image quality can be in the eye of the beholder — that's why it makes sense to look before you buy. In any case, all the products on the market now seem to deliver adequate business color.

Keep in mind that a few models with 1,200dpi maximum resolutions may extract hefty speed penalties when you take advantage of their capabilities. Hence, even if 1,200dpi is available, you might choose to print most of your work at 600dpi on some printers.

"True" high resolution

As indicated above, many printers offer resolutions higher than 600dpi. But within the printer industry, there are occasional squabbles about what can really be considered "true" high-resolution output.

Some laser printers that boast resolutions higher than 600dpi are actually based on what were originally designed to be 600dpi engines, but they use software that causes the laser beam to create a higher-resolution image by placing tens of thousands of additional tiny dots. This process is sometimes known as "software interpolation" or "modulation."

Most newer engines are designed from the ground up to work at resolutions higher than 600dpi. The technical arguments get pretty complex, but purists insist that "from the ground up" means "better." The phrases "native resolution" and "true resolution" are sometimes used to refer to the base resolution of an engine before any software modulation kicks in.

As we've said previously, true 1,200dpi resolution on some printers can result in a big hit on some printers' speeds. Note that modulated higher resolutions sometimes have numbers that read something like "1,200 x 600dpi" — in other words, the "dot intensity" along one axis is greater than along the other. Vendors often use the term "class" to mean interpolation, as in "2,400dpi class." That simply means an interpolated resolution of 2,400dpi.

How much does 1,200 x 600dpi differ from 600dpi or 1,200dpi? The difference may be visible in complex graphics and smaller type sizes, but only with a magnifying glass. Your salesman may tout these figures, but they are less important than the actual appearance of the printed page and the quality of the imaging system and toner, which can't be measured in numbers.

Operating Costs

Operating cost comparisons can be quite tricky to make in the color printer market. In the monochrome market, there's a consensus among vendors that quoted consumables figures are based on an assumption of the image area covering 5 percent of a page (which is more than it sounds when you think about the white space in the middle of letters like "e" and "o"). Although that 5 percent figure may or may not be an accurate representation of what occurs in practice, it does provide a constant standard against which you can make like-for-like comparisons between different monochrome machines.

In the color market, however, numerous variables can enter into a cost-per-page analysis. For example, the cost of a printed page depends not only on the size of the image area but also on the color mix and the type of image being printed. A number of vendors have come up with their idea of the standard page on which they base their cost-per-page figures. The problem, however, is that the standards may be different from vendor to vendor.

Not surprisingly, the different standards tend to show a particular vendor in its best possible light — a vendor with especially low black toner costs might assume a higher proportion of black, for example. And some vendors quote cost-per-page figures without even explaining the basis on which they are reached.

Putting aside the issue of vendor self-interest, a recent color study by Xerox showed that the average business page coverage is more like 4 percent per color than 5 per-

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cent and that black is much more prevalent than the other three colors. It is important to keep in mind that estimating color operating costs is not an exact science. Other experts in the business differ from Xerox, and we tend to think that the real-life coverage may average more like 6 or 7 percent per color. Be aware that all vendor cost estimates are probably on the low side.

The method we prefer

In order to compare operating costs, Better Buys for Business has adopted a standard page definition that — while it does not set out to be more or less representative than the others — does provide a simple standard on which it is easy to make transparent comparisons. The assumption is simply that there is 5 percent coverage of each of the four colors in the CMYK palette. We take into account all consumable items that need regular replacement, not just the obvious ones such as toner and the imaging cartridge (drum or belt). This method — which is also used by most vendors — is really an extension of the standard we use for comparing black-and-white costs.

The Dell 3110cn includes PostScript, a rare feature among sub-$500 color laser printers.

What to expect

Using this method, the per-page color costs of most recently introduced color printers fall in the 9–15¢ range, though a couple of vendors have managed to bring costs down to 4–5¢. Black-and-white page costs on some color models typically cluster around 2 or 2.5¢, with a growing number under 1.5¢.

Keep in mind that the machines come with a full set of starter supplies included in the purchase price (though sometimes with reduced-capacity toner cartridges). Since some of the supply items (such as drums and belts) can last for tens of thousands of pages, this means that it will be quite awhile before you actually have to pay the full cost per page in terms of separately purchased supply items.

Supply items are discountable, but some brands are more widely discounted than others.

More About Features

Next, a few words on features to look for — but because none of these are color-specific, we won't go into a lot of detail.

PostScript tips

PostScript is what's known as a "page description language" — it is software that resides within the printer and governs the way in which the machine handles instructions from the computer. If you want to read more about it, there's a discussion in the Better Buys *Office Laser Printer Guide* (see back cover for details).

For now, we'll just remind you about when you do and don't need it. Note that while almost all the printers in this guide come with PostScript standard, some discussion is still required on the subject. This is because some of the least expensive printers we cover — from Konica Minolta, for example — come without PostScript. So if you're trying to save a buck by buying an inexpensive printer, you need to be sure you can live without PostScript.

So when do you need PostScript? If you use serious desktop publishing programs (Adobe PageMaker, Quark XPress, etc.), you definitely need it. The same applies if you use upscale graphics programs such as Adobe Illustrator.

If, however, you use only word processing and business productivity programs, such as Microsoft Word, Excel, and PowerPoint, you probably don't need a PostScript printer. A PostScript printer will be able to work with these programs, but it isn't necessary or even particularly advantageous. In this case, you might want to purchase either a model without PostScript or one that offers it as an option that you can add later if you need it.

While some printers recently offered Adobe PostScript Level 2 compatibility, all of the PostScript-capable machines in this guide support PostScript 3, which offers a variety of small enhancements — some of which are particularly relevant to color. If you want to match precise colors on your output, PostScript 3 can be a plus.

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Some printers don't employ the original Adobe PostScript but instead use a PostScript-compatible print language developed by a third party. This isn't a big negative these days, though some people still feel more secure with the original.

Most PostScript printers also offer PCL printing. This printer control language was designed originally by Hewlett-Packard and is generally used for everyday office work. Other machines offer only Windows-based GDI printing, which has a more limited set of capabilities. Its main disadvantage is that it can tie up your computer until the page is printed; that is, you can't "spool" the job to a server or printer and get right back to work. That is especially a problem with longer and more complex jobs.

Memory and processors

The relationship and role of memory and controllers are discussed in the Better Buys *Office Laser Printer Guide.* We are not going to dwell much on them here, save to say that more memory and powerful controllers enhance a printer's speed and are essential for more ambitious types of work. (Controllers are the so-called front end of printers and they process incoming data sent from connected PCs.)

The good news is that vendors are becoming more generous with the amount of memory they package into their color laser printers as standard. Only a couple years ago, printers with 64MB of memory were in the minority. Today, however, all but a few of the printers covered in this guide have at least 64MB of standard memory, with a substantial number offering at least 128MB as standard. "Memory-starved" color printers — those with 64MB of memory (only a handful now have less) included in the basic deal — have dwindled to a small minority. Because color files are bigger than black-and-white files, the need for memory is greater than that for similar speed black-and-white printers.

Keep in mind, though, that differing memory compression methods make it hard to infer too much from the exact amount that's offered. Also, memory matters a lot more for PostScript printing than for PCL printing from standard office applications. For GDI printing, memory is not an issue.

Rest assured that you can often upgrade the memory to more than you would ever dream of getting, though this does add some cost into the equation. For example, OKI's C9600 and C9800 color printer series will allow you to boost the memory as high as 1,024MB (one gigabyte).

Most printers use controllers that are proprietary to the individual model. However, a few use dedicated processors developed by a company called Electronics for Imaging. This company, known as EFI, is best known for supplying the front ends to connected color copiers (enabling the latter to double as high-performance printers).

The presence of an EFI controller on a desktop printer is a good indication that the machine has sufficient horsepower to deal with pretty serious workloads in terms of the complexity of files and the quantity being sent in close succession. That isn't to say that non-EFI controllers are necessarily less powerful. It's just that it's hard for a buyer to assess the performance of a controller from specifications alone unless it is made by a recognized third party that supplies more or less the same front ends to a variety of different vendors. In short, there is a degree of comfort in knowing that a controller is EFI-supplied. However, printer vendors have not been asleep during the past few years, and several have controllers of their own that are comparable to EFI's.

Paper handling

Traditionally, desktop color lasers have come with a 250-sheet paper tray and have allowed you to add a second one as an option. Paper capacity is becoming more generous, however, and several recently introduced models offer additional standard 250-sheet trays, 500- or 550-sheet trays, and even a 2,000- or a 2,500-sheet tray in several cases. Larger tray capacities are likely to be particularly important if you also plan to use your color laser as a mainstream black-and-white printer.

Often, the standard 250-sheet tray is supported by a multipurpose tray holding 100–150 sheets. As well as offering the convenience of a second active paper source, this tray can often take heavier paper weights than the main tray. By no means are all machines suitable for heavy paper or light card stock — be sure to satisfy yourself that the printer is comfortable with any challenging materials you want to feed it.

There are now a fairly large number of machines on the market that are able to take 11" x 17" (or ledger-size) paper. Typically, these can actually take paper a little larger than that in order to give you the ability to print 11" x 17" images with full bleed (the image going off the edge). Among other things, this is very helpful for producing proofs of layouts that are being sent out to a commercial printer.

Another now-common feature is automatic duplexing (double-sided printing). Nearly all of the printers we cover now offer this, more frequently as an option, but in a growing number of cases as a standard feature. Previously, even manual duplex was not typically recommended on desktop color lasers because of paper-jamming issues. Shorter paper paths and better paper-feeding technology have overcome much of this problem.

All models can print onto transparencies, but most

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require special ones that cost more than the regular variety. Printing on transparencies always runs slower than on regular paper.

Interfaces & network connectivity

Older color printers come with parallel interfaces standard. This ensures that they are compatible with all Windows PCs. More common on newer machines is a Universal Serial Bus (USB) port, which is used for direct connection to a PC (or a Mac). USB interfaces, especially the now widely used Version 2.0, provide faster data flow than parallel interfaces and are "hot-swappable." That means you can connect or disconnect the printer without restarting your computer. It also can be used with Macintosh computers.

All workgroup color printers can be fitted with network interface cards that allow you to connect them directly to Ethernet. This is a standard feature on most printers in this guide. Also optionally available — though increasingly less important — are Token Ring network interfaces.

Some newer models are offering wireless connectivity: either the Ethernet-based IEEE 802.11b (sometimes known as "Wi-Fi") or (less commonly) the infrared Bluetooth. We discuss these in more detail in the *Business Ink Jet Printer Guide* in this volume (pages 125–130).

Buying a Color Laser Printer

Recent price reductions have helped make color laser printers more mainstream devices, and this has meant that they are easier to buy than before. Previously, a lot of places you could turn to for black-and-white laser printers simply did not sell color models. Today, any reseller that handles faster black-and-white printers — for example, 24–40ppm models — is likely to offer one or more color models as well.

This is a market where vendors generally sell through distributors that supply the computer dealer channel. As a rule, vendors do not maintain a network of authorized dealers that are supplied direct. An exception is when some manufacturers that are also in the copier business sell color lasers through their copier dealers as well as through the main computer printer channel.

In the past, vendors haven't dealt directly with end users, except when pursuing the very largest accounts. This has changed, however, with the advent of purchasing over the Internet.

Certain vendors — Hewlett-Packard (www.hp.com) and Lexmark (www.lexmarkstore.com) among them — will sell end users just about any of their color laser machines from their own sites on the Web. Xerox tends to direct customers to reseller sites or to brick-and-mortar dealerships for most color lasers.

Still other vendors do little or no direct selling over the Internet, although their color laser products are available on online reseller sites. Some of these sites are multi-line resellers, such as Zones (www.zones.com), Computer Discount Warehouse (www.cdw.com), and PC Connection (www.pcconnection.com) — while others are the online shop windows of in-store retailers such as Staples (www.staples.com) and Best Buy (www.bestbuy.com). The latter sites have a much smaller selection of color laser printers than the former.

Some of the online vendors also offer printer leases, extended warranties, and additional services, such as installation by a local dealer. Generally speaking, you may not get the very lowest prices on the vendors' sites. (After all, they can't undersell their retail vendors and resellers.) But their prices are a good reference point to start from. They also may include rebates and special offers.

We can't stress enough, however, the importance of seeing color output with your own eyes, especially if you are going to do more than just add color to text-based documents. It's not a good idea, in our opinion, to buy a color printer over the Web without seeing a few hard-copy samples first.

Warranties and consumables

Most color laser models have warranties that include one year of onsite service. However, a few models through copier companies bear 90-day warranties. You'll need to contract with a dealer for a service contract beyond that period.

Keep in mind that there is less competition in the market for color supplies than in the black-and-white supplies market. Resellers do, however, compete on price over the "official" supplies for the most popular brands; consumables for the HP Color LaserJet series tend to be discounted most of all. And naturally, consumables are also widely available over the Web.

Because actual, or "street," prices for color printer consumables vary widely, we don't attempt in our Consumables Costs at-a-Glance charts (see the Vendor & Product Profiles section beginning on page 3) to report these prices. Instead, we give you the "list" prices at which vendors suggest that consumables be sold or the "Web" prices on the vendors' own Website. These prices will give you an idea, although not a perfect one, of which printers are the most economical to run. ✍

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A-Z Guide to Features & Technology

All-in-one: 1. A multifunctional printer (usually an ink jet) that can scan, copy, and/or fax.

2. A consumables cartridge on a laser printer that has both toner and drum in a single unit.

Bit: A piece of digital information consisting of a single binary digit (that is, a 1 or a 0). This is the number of bits a printer uses at each pixel to compose an image in scales of gray or in color. Typical bit depths are 8 bits for black-and-white, 24 bits for color. Together, 8 bits make a byte, another unit of digital information. *See* also byte.

Bluetooth: An industry specification for wireless communication; an alternative to Wi-Fi. For the printing industry, it means some mobile phones, laptops, and personal digital assistants (PDAs) can send jobs to printers.

Byte: A unit of digital information consisting of 8 bits. The memory capacity of printers is usually expressed in megabytes (a megabyte is 1,024 kilobytes).

Calibration: The process by which users ensure that what they print is consistent with the colors they see on their monitor. Printers can't be calibrated very well; monitors can be calibrated to more closely resemble printed output. Printer calibration is typically handled through the unit's print driver.

CMYK: The four-color palette that comprises color laser printing, in which all colors are created from the four primary colors: cyan (blue), magenta (red), yellow, and black. Toner for color printers is typically sold in these four colors.

Collation: A print function that allows you to make multiple copies of multipage originals and have the machine put the pages in order. Without collation, the job would emerge with all the page 1's first, then all the page 2's, then all the page 3's, and so forth. With collation, the pages emerge 1-2-3, 1-2-3, 1-2-3, and so on. To do this, the machine scans the job, stores it in memory, and outputs the pages in order.

Controller: This refers to the device at the heart of a printer that processes an electronic file into information that can be printed on paper. The controller is also referred to as an "RIP" (raster image processor). The controller is driven by a microprocessor, a semiconductor whose speed is rated in megahertz (MHz).

Dealer channel: Refers to traditional office equipment dealers that typically sell copiers and fax machines to corporate customers — in contrast to computer resellers or retail stores that carry mostly small-office products.

Dots per inch (dpi): A measure of the resolution of an image: the higher the figure, the finer the resolution and the sharper the image. Dots per inch are typically expressed with the number of horizontal dots first and the number of vertical dots second, for example, 200 x 400dpi. At that resolution, each square inch of an image would contain 80,000 dots (200 x 400 = 80,000).

Note that we use 600dpi to denote 600 x 600dpi, as well as 1,200dpi to denote 1,200 x 1,200dpi.

The apparent difference in print quality is enormous when comparing 300dpi with 600dpi. But it's pretty hard to notice when comparing 600dpi with 1,200dpi on regular office documents, and even harder with interpolated values over 1,200dpi. Factors such as ink, paper, and image type may be more important than nominal resolution differences.

Double-sided printing: *See* Duplex.

Drum: A drum, or photoconductor, forms the core of the process that allows laser- and LED-powered office machines to create images on paper. It is the rotating cylinder on which a laser writes the image. The surface of the drum becomes electrically charged by the laser, and toner is attracted to the areas where the latent image is present. As the paper passes through the engine, the toner is transferred from the drum to the paper. A fuser unit uses heat to bond the toner to the paper.

Duplex: Double-sided printing. Many printers now offer automatic duplex. With that feature, the machine prints on one side, reverses the page, and then prints on the other side. Manual duplex, in which you turn over the pages by hand once they've been printed on one side, is available on all models.

Electronic collation: *See* Collation.

Energy Star: Stamp of approval from the US Environmental Protection Agency (EPA) for office equipment that meets various "green" criteria. The difference in energy efficiency between an Energy Star–compliant model and a non-compliant one can be quite small

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at this level of the market, so you should avoid making this too much of a litmus test in your purchasing decision.

Engine speed: This refers to the speed at which a printer can output pages. Speeds in the market we cover in this guide range up to 49ppm in black-and-white. While most printers run at or near rated speeds, allow for some warm-up time on the first page.

Ethernet: Most office printers, especially laser machines, have Ethernet options, enabling them to be connected directly to a computer network. This allows more than one desktop computer user to share a printer. This can be done through internal cards or through external dedicated servers. On low-end machines, connectivity to an external server runs through a USB port. Most of the time, a printer hooked up in this manner is accessible only via that computer.

There are two basic flavors of Ethernet supported in most offices: 10BaseT and 100BaseT. In theory 100BaseT, the industry standard, is ten times faster than 10BaseT, but in practice it is usually only a few times faster. Still, that increase in speed can be significant. Wireless Ethernet (IEEE 802.11b) is also available now on some models, as is gigabit Ethernet (1000BaseT).

External print server: This refers to an electronic device that allows a printer to be connected to a computer network, usually 100BaseT Ethernet, even though it doesn't have a network interface card. The device connects to the printer through its USB port but uses a network connection to connect to the network. Some vendors sell their own external print servers. The best-known line of external servers is Hewlett-Packard's JetDirect product family. The external print server is a substitute for an internal Ethernet card — not all models in this guide have the internal slot necessary for a network card. External servers can also be used for wireless connectivity, for connection to "thick" or "thin" Ethernet networks, or for connection to old-fashioned Token Ring networks.

GDI (Graphic Device Interface): GDI describes the kind of printing that relies on the host computer to process the image to be printed from a Windows platform. (Note that you may encounter the phrase "host-based printing" in place of GDI.) The technology uses the same graphics imaging method used to display a page on your computer screen. This type of printer typically has little on-board memory of its own, since all the work of processing the print job is done on the host computer.

GDI printers are easier (and less expensive) to build, but they have several drawbacks. They can print only what you can see on the screen, which is fine for most office work, but they're not suitable for more sophisticated page-layout or illustration files. Second, they can tie up your computer with a lot of extra processing, whereas a printer using either PCL or PostScript has the processing power to do the work itself, freeing up your computer. Also known as "Windows printing" or "Windows GDI."

Host-based printing: Printing directly from a computer using its native graphics interface (namely, the one it uses to display a page on your computer screen). In Windows that usually means GDI printing, but it can mean some other proprietary format.

Interface: Refers to the hardware that allows electronic devices to communicate. In this guide, we're primarily concerned with the connections between printers and computers — these are usually parallel or USB, though many now offer Ethernet network connectivity.

Interpolation: Software enhancement of an image that's done to improve resolution during printing or scanning. Interpolation essentially consists of laying down additional dots in the spaces between the dots that make up an image, based on an analysis of the surrounding dots.

IrDA (Infrared Data Association): A wireless transmission standard used on some devices. It's slower than Bluetooth or Wi-Fi.

Laser: Premium imaging technology, and also the most widely used in the business world — the same as that used in laser printers. It involves fusing toner particles to a page using heat.

LED (Light-Emitting Diode): A variation of laser technology; we place it in the "laser-class" category. It's sometimes regarded as less desirable than laser, but this is something of an ill-grounded prejudice, as any difference isn't noticeable to users in the ordinary course of events. Our advice is that buyers should regard lasers and LEDs as effectively one and the same. LED is being used increasingly in low-cost color machines.

Megabyte (MB): *See* Byte.

The Konica Minolta magicolor 2500W's printing can be interpolated up to 9,600 x 600dpi quality.

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Megahertz (MHz): *See* Controller.

Native resolution: The print resolution level at which an office machine is capable of functioning without the assistance of software interpolation. Sometimes referred to as "true resolution." *See* also Interpolation, Resolution.

Network card: Also known as an "Ethernet card" or an NIC (Network Interface Card), it's the board that's installed into a slot in certain printers that allows them to be connected to a computer network. See also Ethernet.

Paper capacity: The amount of paper held in a machine's paper tray(s).

Paper drawer/tray: We tend to use the words "drawer" and "tray" interchangeably when talking about paper supplies. Some vendors use the term "tray" to describe a replaceable unit that can be slipped into a drawer, such as one containing special paper.

Parallel port: A common method of connecting a printer to a PC for the purpose of printing or scanning. See also USB.

PCL: Printer industry language developed by Hewlett-Packard and used on a large number of printers. The printer language determines the way the printer receives instructions from the computer software. The latest level of PCL, PCL 6, is available on most of the machines covered in this guide, where it usually comes paired with PCL 5e.

PDF (Portable Document Format): File format that allows users to capture all of a document's visual elements as an electronic image you can view, print, or archive on any computer. PDF was created by Adobe Systems, which supplies tools including a free program (Acrobat Reader) for reading the files. The advantage of PDF is that files are small yet retain the appearance of the original image and are platform-independent. A number of printers allow you to print PDF files directly without opening them up in Acrobat.

The $279 (street) Ricoh GX3050N GelSprinter prints at 29ppm using waterproof color ink.

Photo card: A digital memory card that is used to store digital photos. A growing number of color printers have card readers that allow you to print pages from such a card. There are a variety of photo card formats from different vendors (sadly, there's no standard). Most photo card readers will handle a variety of formats.

PictBridge: A standardized technology developed by the Camera & Imaging Products Association for direct printing from a digital camera to a color printer. A common feature among ink jet color machines, PictBridge is becoming more popular on color laser machines.

PMS (Pantone Matching System): The established industry standard for accurate color reproduction. It's a numbering system that defines about 750 shades of color published in Pantone, Inc.'s color swatches. Pantone licenses these colors to color printer manufacturers, effectively endorsing their products as being able to faithfully reproduce PMS colors.

Port: *See* Interface.

Portable Document Format: *See* PDF.

PostScript: PostScript is a printer language created by Adobe Systems. When you use PostScript, your computer sends a description of the page to be printed to the printer, which in turn interprets the data and outputs the page. This contrasts with the PCL approach, under which the computer sends a series of commands to the printer rather than an overall page description. PostScript works across different computer platforms — it's not Windows-specific — and it's particularly well suited for high-resolution graphics. All current PostScript printers use the latest version: PostScript 3. *See* also PCL.

ppm: Pages per minute. It is the measure of a machine's engine speed when making letter-size prints or copies. *See* also Engine speed.

Print engine speed: *See* Engine speed.

Print memory: Print memory is usually expressed in megabytes (MB). All other things being equal, the greater a machine's print memory, the greater its capacity to handle complicated jobs involving large electronic files. Note that in many models, print memory is shared with the fax machine.

Printer driver: The software that permits your desktop computer to "talk" to the printer. The printer driver usually comes on a CD-ROM that you must load into your computer. (Some vendors will also let you download drivers from the Internet.) You see the driver on your screen as one or more dialog boxes that allow you to choose print options such as the number of prints desired, collation, and image size and orientation.

Processor: *See* Controller.

Resolution: Electronic images are formed out of tiny

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A wireless option is available for the Samsung CLP-600N, which also has standard Ethernet and USB connectivity.

dots. The more dots, the higher the resolution and generally the better the image quality. The number of vertical lines by the number of horizontal lines in a square inch defines resolution. So when you see a quoted resolution of, say, 200 x 400dpi (dots per inch), it means 200 vertical lines crossing 400 horizontal lines in each square inch — or 80,000 dots per square inch. *See* Dots per inch.

Retail channel: Refers to retail stores such as Office Depot, OfficeMax, and Staples that sell low-end office equipment. Also includes mail-order companies, warehouse stores, and consumer electronics stores.

RIP: Raster image processor. *See* Controller.

Toner saver mode: Feature in some printers that allows you to print some pages with fewer toner particles (less density), saving money. This is useful for in-house draft documents. A few models allow you to select this mode right on the printer by pressing a button.

USB: Universal Serial Bus, a technology for connecting computers to peripheral devices such as printers. USB offers several advantages over parallel connectivity. It transmits data much faster, and the technology enables you to "plug and play." USB technology is supported by both PCs and Macs. A growing number of printers have USB connectivity only. Ethernet servers usually are attached to the USB port. All units in this guide use Version 2.0 of the USB standard, which allows for faster operation. *See also* Parallel port.

Wi-Fi: *See* Wireless Ethernet.

Windows printing: *See* GDI.

Wireless Ethernet: Also called Wi-Fi or IEEE 802.11b or g. This is a growing standard for wireless local area networks (WLANs). This protocol defines a full Ethernet connection between devices and gives physically unconnected computers connectivity to a printer over a local area network (LAN). IEEE 802.11b signals can go through walls, and transmissions can extend to a distance of 100 feet or more. 802.11g is a faster version than 802.11b, though all 802.11g devices can support 802.11b.

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Model	*Brother HL-2700CN*	*Brother HL-4200CN*	*Dell Color Laser Printer 3010cn*
List price	$850	$2,900	None
Street price (October 2006)	$500	$1,300	$379
Full-color print engine speed (pages per minute)	8ppm	26ppm	5ppm
Black-only print engine speed (pages per minute)	31ppm	26ppm	25ppm
First page out	*Black:* 13 seconds *Color:* 19 seconds	*Black:* 17 seconds *Color:* 17 seconds	*Black:* 9 seconds *Color:* 17 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Fuji Xerox	Lexmark
Maximum resolution	2,400 x 600dpi (interpolated)	1,200dpi	2,400dpi (interpolated)
Processor	300MHz	400MHz	300MHz
Standard memory	64MB	64MB	64MB
Maximum memory	576MB	320MB	576MB
Hard drive	No	20GB ($699 list)	No
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	No
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 500	1 x 150
Optional paper supply	1 x 530 ($549 list)	1 x 500 ($549 list) 1 x 1,000 ($999 list)	1 x 250 ($149 street) 1 x 500 ($230 street)
Bypass	No	1 x 100	No
11" x 17" paper	No	No	No
110 lb. index	Yes	Bypass	No
Automatic duplex	Optional ($999 list)	Standard	No
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	30,000 black pages; 5,000 color pages	60,000 pages	45,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2004	2003	2006
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Model	*Dell* *Color Laser Printer 3110cn*	*Dell* *Color Laser Printer 5110cn*	*Gestetner* *P7431cn*
List price	None	None	$899
Street price (October 2006)	$499	$999	$699
Full-color print engine speed (pages per minute)	17ppm	35ppm	8ppm
Black-only print engine speed (pages per minute)	31ppm	40ppm	31ppm
First page out	*Black:* 9 seconds *Color:* 17 seconds	*Black:* 10 seconds *Color:* 17 seconds	*Black:* 14 seconds *Color:* 20 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Lexmark	Ricoh
Maximum resolution	2,400dpi (interpolated)	2,400dpi (interpolated)	1,200 x 600dpi
Processor	400MHz	400MHz	300MHz
Standard memory	128MB	128MB	128MB
Maximum memory	1,152MB	1,152MB	384MB
Hard drive	No	40GB ($150, street)	10GB ($400 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	Optional	Optional	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	Optional
Standard paper supply	1 x 150, 1 x 250	1 x 500	1 x 250
Optional paper supply	1 x 550 ($229 street)	1 x 500 ($229 street) 1 x 1,000 ($500 street)	1 x 530 ($350 list)
Bypass	No	1 x 150	No
11" x 17" paper	No	No	No
110 lb. index	No	No	Yes
Automatic duplex	Optional ($199 street)	Standard	Optional ($230 list)
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	60,000 pages	95,000 pages	10,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2004	2004
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Model	*Gestetner C7521n* EDITOR'S CHOICE 2007	*Gestetner C7526dn*	*Gestetner C7528n* EDITOR'S CHOICE 2007
List price	$999	$1,199	$3,495
Street price (October 2006)	$699	$999	$2,899
Full-color print engine speed (pages per minute)	22ppm	26ppm	28ppm
Black-only print engine speed (pages per minute)	22ppm	26ppm	32ppm
First page out	*Black:* 14 seconds *Color:* 15 seconds	*Black:* 11 seconds *Color:* 16 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	533MHz	600MHz	733MHz
Standard memory	128MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	20GB ($315 list)	40GB ($815 list)	40GB ($599 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 630	1 x 550	2 x 500
Optional paper supply	Up to 2 x 530 ($375 each, list)	2 x 550 ($390 each, street)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	Yes
110 lb. index	No	No	No
Automatic duplex	Optional ($230 list)	Standard	Optional ($300 list)
Output devices	1 x 250 (standard)	1 x 500 (standard)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling & booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)
Monthly duty cycle	50,000 pages	150,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2005
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Model	*Gestetner C7528nD* EDITOR'S CHOICE 2007	*Gestetner C7531dn*	*Gestetner C7535n*
List price	$3,795	$1,599	$5,095
Street price (October 2006)	$3,129	$1,399	$4,299
Full-color print engine speed (pages per minute)	28ppm	31ppm	35ppm
Black-only print engine speed (pages per minute)	32ppm	31ppm	35ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 16 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	733MHz	600MHz	733MHz
Standard memory	256MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB ($599 list)	40GB ($315 list)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	2 x 500	1 x 550	2 x 500
Optional paper supply	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)	2 x 550 ($390 each, street)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	No	Yes
110 lb. index	No	Yes	No
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($3,115 list) 1 x 1,000 with 50-sheet multiposition stapling & booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,000)	1 x 500 (standard)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling & booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,000)
Monthly duty cycle	200,000 pages	150,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2006	2005
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Model	*Hewlett-Packard Color LaserJet 1600*	*Hewlett-Packard Color LaserJet 2600n*	*Hewlett-Packard Color LaserJet 2605dn*
List price	None	None	None
Street price (October 2006)	$299	$399	$499
Full-color print engine speed (pages per minute)	8ppm	8ppm	10ppm
Black-only print engine speed (pages per minute)	8ppm	8ppm	12ppm
First page out	*Black:* 20 seconds *Color:* 20 seconds	*Black:* 20 seconds *Color:* 20 seconds	*Black:* 20 seconds *Color:* 20 seconds?
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	600dpi	600dpi	2,400dpi (interpolated)
Processor	300MHz	300MHz	300MHz
Standard memory	16MB	16MB	64MB
Maximum memory	16MB	16MB	320MB
Hard drive	No	No	No
PostScript	No	No	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	1 x 250 ($150 street)	1 x 250 ($150 street)	1 x 250 ($150 street)
Bypass	No	No	No
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	No	No	No
Output devices	1 x 125 (standard)	1 x 125 (standard)	1 x 125 (standard)
Monthly duty cycle	20,000 pages	35,000 pages	35,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2006
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Model	*Hewlett-Packard Color LaserJet 2605dtn*	*Hewlett-Packard Color LaserJet 3000*	*Hewlett-Packard Color LaserJet 3000n*
List price	None	None	None
Street price (October 2006)	$699	$999	$1,199
Full-color print engine speed (pages per minute)	10ppm	15ppm	15ppm
Black-only print engine speed (pages per minute)	12ppm	30ppm	30ppm
First page out	*Black:* 20 seconds *Color:* 20 seconds	*Black:* 11 seconds *Color:* 15 seconds	*Black:* 11 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	2,400dpi (interpolated)	2,400dpi (interpolated)	2,400dpi (interpolated)
Processor	300MHz	533MHz	533MHz
Standard memory	64MB	64MB	128MB
Maximum memory	320MB	512MB	512MB
Hard drive	No	20GB (price not available)	20GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Optional	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	1 x 250 ($150 street)	1 x 500 ($249, street)	1 x 500 ($249, street)
Bypass	No	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Standard	Optional ($300 street)	Optional ($300 street)
Output devices	1 x 125 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	35,000 pages	60,000 pages	50,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2005	2005
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Model	*Hewlett-Packard Color LaserJet 3000dn*	*Hewlett-Packard Color LaserJet 3000dtn*	*Hewlett-Packard Color LaserJet 3600*
List price	None	None	None
Street price (October 2006)	$1,499	Price not available	$599
Full-color print engine speed (pages per minute)	15ppm	15ppm	17ppm
Black-only print engine speed (pages per minute)	30ppm	30ppm	17ppm
First page out	*Black:* 11 seconds *Color:* 15 seconds	*Black:* 11 seconds *Color:* 15 seconds	*Black:* 14 seconds *Color:* 14 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	2,400dpi (interpolated)	2,400dpi (interpolated)	3,600dpi (interpolated)
Processor	533MHz	533MHz	360MHz
Standard memory	356MB	356MB	64MB
Maximum memory	512MB	512MB	64MB
Hard drive	20GB (price not available)	20GB (price not available)	No
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	No
Ethernet	Standard	Standard	Optional
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250, 1 x 500	1 x 250
Optional paper supply	1 x 500 ($249, street)	No	1 x 500 ($249, street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Standard	Standard	Optional ($300 street)
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	50,000 pages	60,000 pages	50,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2005	2005
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Model	*Hewlett-Packard Color LaserJet 3600n*	*Hewlett-Packard Color LaserJet 3600dn*	*Hewlett-Packard Color LaserJet 3600dtn*
List price	None	None	None
Street price (October 2006)	$699	$999	$1,599
Full-color print engine speed (pages per minute)	17ppm	17ppm	17ppm
Black-only print engine speed (pages per minute)	17ppm	17ppm	17ppm
First page out	*Black:* 14 seconds *Color:* 14 seconds	*Black:* 14 seconds *Color:* 14 seconds	*Black:* 14 seconds *Color:* 14 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	3,600dpi (interpolated)	3,600dpi (interpolated)	3,600dpi (interpolated)
Processor	360MHz	360MHz	360MHz
Standard memory	64MB	128MB	128MB
Maximum memory	64MB	128MB	128MB
Hard drive	No	No	No
PostScript	No	No	No
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250, 1 x 500
Optional paper supply	1 x 500 ($249, street)	1 x 500 ($249, street)	No
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Optional ($300 street)	Standard	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	50,000 pages	50,000 pages	50,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2005	2005
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Model	*Hewlett-Packard Color LaserJet 3800*	*Hewlett-Packard Color LaserJet 3800n*	*Hewlett-Packard Color LaserJet 3800dn*
List price	None	None	None
Street price (October 2006)	$799	$999	$1,299
Full-color print engine speed (pages per minute)	22ppm	22ppm	22ppm
Black-only print engine speed (pages per minute)	22ppm	22ppm	22ppm
First page out	*Black:* 13 seconds *Color:* 13 seconds	*Black:* 13 seconds *Color:* 13 seconds	*Black:* 13 seconds *Color:* 13 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	3,600dpi (interpolated)	3,600dpi (interpolated)	3,600dpi (interpolated)
Processor	350MHz	350MHz	350MHz
Standard memory	96MB	160MB	288MB
Maximum memory	544MB	544MB	544MB
Hard drive	20GB (price not available)	20GB (price not available)	20GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Optional	Standard	Standard
Wireless	IEEE 802.11b/g (optional)	IEEE 802.11b/g (optional)	IEEE 802.11b/g (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	1 x 500 ($249, street)	1 x 500 ($249, street)	1 x 500 ($249, street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Bypass	Bypass	Bypass
Automatic duplex	Optional ($300 street)	Optional ($300 street)	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	55,000 pages	55,000 pages	55,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2005	2005
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Model	*Hewlett-Packard Color LaserJet 3800dtn*	*Hewlett-Packard Color LaserJet 4700* EDITOR'S CHOICE 2007	*Hewlett-Packard Color LaserJet 4700n* EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$1,549	$1,799	$1,999
Full-color print engine speed (pages per minute)	22ppm	31ppm	31ppm
Black-only print engine speed (pages per minute)	22ppm	31ppm	31ppm
First page out	*Black:* 13 seconds *Color:* 13 seconds	*Black:* 10 seconds *Color:* 10 seconds	*Black:* 10 seconds *Color:* 10 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	3,600dpi (interpolated)	3,600dpi (interpolated)	3,600dpi (interpolated)
Processor	350MHz	533MHz	533MHz
Standard memory	288MB	160MB	160MB
Maximum memory	544MB	544MB	544MB
Hard drive	20GB (price not available)	40GB (price not available)	40GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Optional	Standard
Wireless	IEEE 802.11b/g (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250, 1 x 500	1 x 500	1 x 500
Optional paper supply	No	No	No
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Bypass	Bypass	Bypass
Automatic duplex	Standard	Optional ($300 street)	Optional ($399 street)
Output devices	1 x 250 (standard)	1 x 500 (standard) 1 x 750 with 30-sheet single-position stapling (price not available)	1 x 500 (standard) 1 x 750 with 30-sheet single-position stapling (price not available)
Monthly duty cycle	55,000 pages	100,000 pages	100,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2004	2004
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Model	*Hewlett-Packard Color LaserJet 4700dn* EDITOR'S CHOICE 2007	*Hewlett-Packard Color LaserJet 4700dtn* EDITOR'S CHOICE 2007	*Hewlett-Packard Color LaserJet 4700ph+* EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$2,499	$3,399	$4,999
Full-color print engine speed (pages per minute)	31ppm	31ppm	31ppm
Black-only print engine speed (pages per minute)	31ppm	31ppm	31ppm
First page out	*Black:* 10 seconds *Color:* 10 seconds	*Black:* 10 seconds *Color:* 10 seconds	*Black:* 10 seconds *Color:* 10 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	3,600dpi (interpolated)	3,600dpi (interpolated)	3,600dpi (interpolated)
Processor	533MHz	533MHz	533MHz
Standard memory	288MB	288MB	544MB
Maximum memory	544MB	544MB	544MB
Hard drive	40GB (price not available)	40GB (price not available)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b/g (optional) Bluetooth (optional)	IEEE 802.11b/h (optional) Bluetooth (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 500	3 x 500	5 x 500
Optional paper supply	No	No	No
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Bypass	Bypass	Bypass
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 500 (standard) 1 x 750 with 30-sheet single-position stapling (price not available)	1 x 500 (standard) 1 x 750 with 30-sheet single-position stapling (price not available)	1 x 500 (standard) 1 x 750 with 30-sheet single-position stapling (standard)
Monthly duty cycle	100,000 pages	100,000 pages	100,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2004	2004	2004
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Model	*Hewlett-Packard Color LaserJet 5550n* EDITOR'S CHOICE 2007	*Hewlett-Packard Color LaserJet 5550dn* EDITOR'S CHOICE 2007	*Hewlett-Packard Color LaserJet 5550dtn* EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$3,549	$3,749	$4,999
Full-color print engine speed (pages per minute)	27ppm	27ppm	27ppm
Black-only print engine speed (pages per minute)	27ppm	27ppm	27ppm
First page out	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 16 seconds *Color:* 16 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	3,600dpi (interpolated)	3,600dpi (interpolated)	3,600dpi (interpolated)
Processor	533MHz	533MHz	533MHz
Standard memory	160MB	160MB	288MB
Maximum memory	544MB	544MB	544MB
Hard drive	20GB ($479 street)	20GB ($479 street)	20GB ($479 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b/g (optional) Bluetooth (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 500	1 x 500	2 x 500
Optional paper supply	3 x 500 ($499 each, street)	3 x 500 ($499 each, street)	2 x 500 ($499 each, street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	No	No	No
Automatic duplex	Optional (price not available)	Standard	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	120,000 pages	120,000 pages	120,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2004	2004	2004
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Model	*Hewlett-Packard Color LaserJet 5550hdn* EDITOR'S CHOICE 2007	*Hewlett-Packard Color LaserJet 9500n*	*Hewlett-Packard Color LaserJet 9500hdn*
List price	None	None	None
Street price (October 2006)	$6,299	$6,799	$9,650
Full-color print engine speed (pages per minute)	27ppm	24ppm	24ppm
Black-only print engine speed (pages per minute)	27ppm	24ppm	24ppm
First page out	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 18 seconds *Color:* 18 seconds	*Black:* 18 seconds *Color:* 18 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Canon	Canon	Canon
Maximum resolution	3,600dpi (interpolated)	4,800 x 600dpi (interpolated)	4,800 x 600dpi (interpolated)
Processor	533MHz	500MHz	500MHz
Standard memory	288MB	160MB	288MB
Maximum memory	544MB	384MB	384MB
Hard drive	20GB (standard)	10GB ($599 street)	10GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b/g (optional) Bluetooth (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)	IEEE 802.11b/g (optional) Bluetooth (optional)
USB interface	Standard	No	No
Integrated copy function	No	No	No
Standard paper supply	4 x 500	2 x 500	2 x 500, 2 x 1,000
Optional paper supply	No	No	No
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	No	Bypass	Bypass
Automatic duplex	Standard	Optional ($499 street)	Standard
Output devices	1 x 250 (standard)	1 x 100, 1 x 500 (standard)	1 x 100, 1 x 500 (standard) 1 x 3,000 ($1,810 street) 1 x 3,000 with 50-sheet multiposition stapling ($2,200 street) 1 x 1,000 with 50-sheet multiposition stapling & booklet maker with saddlestitcher ($2,420 street)
Monthly duty cycle	120,000 pages	200,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2004	2003	2003
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Model	IBM Infoprint Color 1334	IBM Infoprint Color 1534n	IBM Infoprint Color 1534dn
List price	$922	Not available	Not available
Street price (October 2006)	$813	$737	$1,054
Full-color print engine speed (pages per minute)	8ppm	20ppm	20ppm
Black-only print engine speed (pages per minute)	30ppm	20ppm	20ppm
First page out	*Black:* 13 seconds *Color:* 19 seconds	*Black:* 13 seconds *Color:* 13 seconds	*Black:* 13 seconds *Color:* 13 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	2,400dpi (interpolated)	4,800dpi (interpolated)	4,800dpi (interpolated)
Processor	500MHz	500MHz	500MHz
Standard memory	128MB	128MB	128MB
Maximum memory	320MB	640MB	640MB
Hard drive	20GB ($526 lstreet)	20GB ($526 street)	20GB ($526 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	1 x 530 ($441 street)	1 x 500 (price not available)	1 x 500 (price not available)
Bypass	No	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Optional ($588 street)	Optional (price not available)	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	35,000 pages	65,000 pages	65,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2004	2005	2005
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Model	*IBM Infoprint Color 1654n Express* EDITOR'S CHOICE 2007	*IBM Infoprint Color 1654dn Express* EDITOR'S CHOICE 2007	*IBM Infoprint Color 1664n* EDITOR'S CHOICE 2007
List price	Not available	Not available	Not available
Street price (October 2006)	Not available	Not available	Not available
Full-color print engine speed (pages per minute)	25ppm	25ppm	25ppm
Black-only print engine speed (pages per minute)	25ppm	25ppm	25ppm
First page out	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 13 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	4,800dpi (interpolated)	4,800dpi (interpolated)	4,800dpi (interpolated)
Processor	800MHz	800MHz	800MHz
Standard memory	256MB	256MB	256MB
Maximum memory	768MB	768MB	768MB
Hard drive	40GB (price not available)	40GB (price not available)	40GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 500	1 x 500	1 x 500
Optional paper supply	1 x 500 ($404 street)	1 x 500 ($404 street)	1 x 500 ($404 street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Optional ($538 street)	Standard	Optional ($538 street)
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	100,000 pages	100,000 pages	120,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2006
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Model	*IBM* *Infoprint Color 1664dn* EDITOR'S CHOICE 2007	*IBM* *Infoprint Color 1567* EDITOR'S CHOICE 2007	*Konica Minolta* *magicolor 2500W*
List price	Not available	$3,786	None
Street price (October 2006)	Not available	$3,483	$299
Full-color print engine speed (pages per minute)	25ppm	32ppm	5ppm
Black-only print engine speed (pages per minute)	25ppm	36ppm	20ppm
First page out	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 10 seconds *Color:* 14 seconds	*Black:* 14 seconds *Color:* 23 seconds
Printing technology	Laser	LED	Laser
Engine manufacturer	Lexmark	Lexmark	Konica Minolta
Maximum resolution	4,800dpi (interpolated)	2,400dpi (interpolated)	2,400 x 600dpi (interpolated)
Processor	800MHz	1GHz	130MHz
Standard memory	256MB	256MB	32MB
Maximum memory	768MB	1GB	32MB
Hard drive	40GB (price not available)	20GB ($526 street)	No
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	No
Ethernet	Standard	Standard	Optional
Wireless	IEEE 802.11b (optional)	IEEE 802.11b/g (optional)	No
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	No	No
Standard paper supply	1 x 500	1 x 550	1 x 200
Optional paper supply	1 x 500 ($404 street)	1 x 550 ($551 street) 2 x 550 ($1,225 street) 1 x 3,000 (price not available)	No
Bypass	1 x 100	1 x 100	No
11" x 17" paper	No	Yes	No
110 lb. index	Yes	No	No
Automatic duplex	Standard	Optional ($624 street)	No
Output devices	1 x 250 (standard)	1 x 100, 1 x 550 (standard) 1 x 1,100 with 30-sheet stapling and 3/4-hole punch ($1,961 street)	1 x 200 (standard)
Monthly duty cycle	120,000 pages	200,000 pages	35,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2005	2006
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Model	*Konica Minolta magicolor 2530 DL*	*Konica Minolta magicolor 2550 EN*	*Konica Minolta magicolor 2550 DN*
List price	None	None	None
Street price (October 2006)	$399	$499	$699
Full-color print engine speed (pages per minute)	5ppm	5ppm	5ppm
Black-only print engine speed (pages per minute)	20ppm	20ppm	20ppm
First page out	*Black:* 14 seconds *Color:* 23 seconds	*Black:* 13 seconds *Color:* 22 seconds	*Black:* 13 seconds *Color:* 22 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Konica Minolta	Konica Minolta	Konica Minolta
Maximum resolution	2,400 x 600dpi (interpolated)	9,600 x 600dpi (interpolated)	9,600 x 600dpi (interpolated)
Processor	130MHz	300MHz	300MHz
Standard memory	64MB	128MB	256MB
Maximum memory	576MB	640MB	640MB
Hard drive	No	40GB ($349 list)	40GB ($349 list)
PostScript	No	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 200	1 x 200	1 x 200
Optional paper supply	1 x 500 ($199 list)	1 x 500 ($199 list)	1 x 500 ($199 list)
Bypass	No	No	No
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Optional ($229 list)	Optional ($229 list)	Standard
Output devices	1 x 200 (standard)	1 x 200 (standard)	1 x 200 (standard)
Monthly duty cycle	35,000 pages	35,000 pages	35,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2006
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Model	*Konica Minolta magicolor 5430 DL*	*Konica Minolta magicolor 5440 DL*	*Konica Minolta magicolor 5450*
List price	None	None	None
Street price (October 2006)	$600	$999	$1,499
Full-color print engine speed (pages per minute)	21ppm	27ppm	27ppm
Black-only print engine speed (pages per minute)	21ppm	27ppm	27ppm
First page out	*Black:* 14 seconds *Color:* 14 seconds	*Black:* 14 seconds *Color:* 14 seconds	*Black:* 14 seconds *Color:* 14 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Konica Minolta	Konica Minolta	Konica Minolta
Maximum resolution	2,400 x 600dpi (interpolated)	2,400 x 600dpi (interpolated)	9,600 x 600dpi (interpolated)
Processor	200MHz	200MHz	667MHz
Standard memory	64MB	64MB	256MB
Maximum memory	576MB	576MB	1GB
Hard drive	No	No	40GB ($349 list)
PostScript	No	No	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 500	1 x 500
Optional paper supply	2 x 500 ($299 each, list)	2 x 500 ($299 each, list)	2 x 500 ($299 each, list)
Bypass	No	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Optional ($399 list)	Optional ($399 list)	Optional ($399 list)
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	60,000 pages	60,000 pages	60,000 pages
Warranty	1 year (exchange)	1 year (exchange)	1 year (exchange)
Year introduced	2004	2005	2005
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Model	*Konica Minolta magicolor 7450* EDITOR'S CHOICE 2007	*Konica Minolta bizhub C250P*	*Konica Minolta bizhub C352P*
List price	None	$7,200	$10,150
Street price (October 2006)	$2,999	Not available	Not available
Full-color print engine speed (pages per minute)	24.5ppm	25ppm	35ppm
Black-only print engine speed (pages per minute)	24.5ppm	25ppm	35ppm
First page out	*Black:* 8.2 seconds *Color:* 11.4 seconds	*Black:* 9 seconds *Color:* 12 seconds	*Black:* 7 seconds *Color:* 9 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Fujitsu/Minolta	Konica Minolta	Konica Minolta
Maximum resolution	9,600 x 600dpi (interpolated)	1,200 x 600dpi (interpolated)	1,800 x 600dpi (interpolated)
Processor	733MHz	466MHz	600MHz
Standard memory	256MB	512MB	512MB
Maximum memory	1GB	512MB	512MB
Hard drive	40GB ($349 list)	40GB ($321 list)	40GB ($321 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	IEEE 1284 (optional)	IEEE 1284 (optional)
USB interface	Standard	Optional	Optional
Integrated copy function	No	Standard	Standard
Standard paper supply	1 x 100, 1 x 250	1 x 250, 1 x 500	1 x 250, 1 x 500
Optional paper supply	3 x 500 ($499 each, list)	1 x 2,500 ($1,260)	1 x 2,500 (price not available)
Bypass	Yes	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Optional ($399 list)	Optional ($455)	Standard
Output devices	1 x 350 (standard)	1 x 1,000 finisher with single-position stapling ($1,580) 2 x 500 finisher with 60-sheet stapling, folding, & booklet maker with saddlestitcher ($3,000) 2/3-hole punch (optional, requires finisher with booklet maker, $525)	1 x 1,000 finisher with single-position stapling ($1,580) 2 x 500 finisher with 60-sheet stapling, folding, & booklet maker with saddlestitcher ($3,000) 2/3-hole punch (optional, requires finisher with booklet maker, $525)
Monthly duty cycle	120,000 pages	75,000 pages	100,000 pages
Warranty	1 year (on site)	90 days (on site)	90 days (on site)
Year introduced	2006	2005	2006
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Model	*Kyocera* *FS-C5015N* EDITOR'S CHOICE 2007	*Kyocera* *FS-C5020N*	*Kyocera* *FS-C5025N* EDITOR'S CHOICE 2007
List price	Not available	$2,199	Not available
Street price (October 2006)	Not available	$1,759 (estimated)	Not available
Full-color print engine speed (pages per minute)	17ppm	17ppm	22ppm
Black-only print engine speed (pages per minute)	17ppm	17ppm	22ppm
First page out	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 13 seconds *Color:* 13 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Kyocera Mita	Kyocera Mita	Kyocera Mita
Maximum resolution	600dpi	600dpi	600dpi
Processor	400MHz	400MHz	500MHz
Standard memory	128MB	128MB	128MB
Maximum memory	640MB	1GB	640MB
Hard drive	40GB ($445 list)	20GB ($479 list)	40GB ($445 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 500	1 x 500	1 x 500
Optional paper supply	Up to 3 x 500 ($299 each, list) 1 x 70 envelope feeder ($219 list)	Up to 3 x 500 ($299 each, list) 1 x 70 envelope feeder ($219 list)	Up to 3 x 500 ($299 each, list) 1 x 70 envelope feeder ($219 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Optional	Optional ($299 list)	Optional
Output devices	Not available	1 x 100, 1 x 500 (standard) 1 x 250 ($40 list)	1 x 100 face-up tray
Monthly duty cycle	50,000	85,000	85,000 pages
Warranty	1 year (parts and labor)	1 year (depot)	1 year (parts and labor)
Year introduced	2006	2005	2006
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Model	*Kyocera FS-C5030N*	*Kyocera FS-C8008N*	*Kyocera FS-C8008DN*
List price	$2,625	$5,525	$5,795
Street price (October 2006)	$2,099 (estimated)	$4,420 (estimated)	$4,636 (estimated)
Full-color print engine speed (pages per minute)	26ppm	8ppm	8ppm
Black-only print engine speed (pages per minute)	26ppm	31ppm	31ppm
First page out	*Black:* 12 seconds *Color:* 12 seconds	*Black:* 17 seconds *Color:* 28 seconds	*Black:* 17 seconds *Color:* 28 seconds
Printing technology	LED	Laser	Laser
Engine manufacturer	Kyocera Mita	Kyocera Mita	Kyocera Mita
Maximum resolution	600dpi	600dpi	600dpi
Processor	600MHz	400MHz	400MHz
Standard memory	128MB	128MB	128MB
Maximum memory	1GB	640MB	640MB
Hard drive	20GB ($479 list)	20GB ($479 list)	20GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 500	2 x 500	1 x 500
Optional paper supply	Up to 3 x 500 ($299 each, list) 1 x 70 envelope feeder ($219 list)	Up to 4 x 500 ($579 each, list)	Up to 4 x 500 ($579 each, list)
Bypass	1 x 100	1 x 150	1 x 150
11" x 17" paper	No	Yes	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Optional ($299 list)	Optional ($999 list, includes 1 x 500 paper supply)	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 250 ($40 list)	1 x 150, 1 x 500 (standard) 1 x 3,000 ($2,679 list) 1 x 600 + 2 x 700 with 20-sheet multiposition stapling ($1,679 list) ** Last two options require 2 x 500 optional paper supply*	1 x 150, 1 x 500 (standard) 1 x 3,000 ($2,679 list) 1 x 600 + 2 x 700 with 20-sheet multiposition stapling ($1,679 list)* ** Finisher requires 2 x 500 optional paper supply*
Monthly duty cycle	100,000 pages	25,000 pages	25,000 pages
Warranty	1 year (depot)	1 year (depot)	1 year (depot)
Year introduced	2005	2003	2003
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Model	*Kyocera FS-C8026N-A*	*Kyocera FS-C8026N-B*	*Lanier LP031c*
List price	$9,498	$9,498	$899
Street price (October 2006)	Not available	Not available	$699
Full-color print engine speed (pages per minute)	26ppm	26ppm	8ppm
Black-only print engine speed (pages per minute)	26ppm	26ppm	31ppm
First page out	*Black:* 9 seconds *Color:* 9 seconds	*Black:* 9 seconds *Color:* 9 seconds	*Black:* 14 seconds *Color:* 20 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Kyocera Mita	Kyocera Mita	Ricoh
Maximum resolution	600dpi	600dpi	1,200 x 600dpi
Processor	600MHz	600MHz	300MHz
Standard memory	512MB	512MB	128MB
Maximum memory	512MB	512MB	384MB
Hard drive	20GB (standard)	20GB (standard)	10GB ($400 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	No	No	Standard
Integrated copy function	No	No	Optional
Standard paper supply	1 x 500, 1 x 1,000, 1 x 1,500	3 x 500	1 x 250
Optional paper supply	None	None	1 x 530 ($350 list)
Bypass	1 x 150	1 x 150	No
11" x 17" paper	Yes	Yes	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	Optional ($499 list)
Output devices	1 x 150, 1 x 500, 1 x 1,000, 1 x 1,500 (standard) 1 x 3,000 with 50-sheet multiposition stapling & saddlestitcher ($3,160 list) 2/3-hole punch ($600 list) 1 x 600 + 2 x 700 with 20-sheet multiposition stapling ($1,679 list) 1 x 600 + 2 x 700 with 20-sheet multiposition stapling ($1,679 list) 16-sheet booklet folder ($1,540 list) 5 x 150 ($800 list)	1 x 150, 3 x 500 (standard) 1 x 3,000 with 50-sheet multiposition stapling & saddlesticher ($3,160 list) 2/3-hole punch ($600 list) 1 x 600 + 2 x 700 with 20-sheet multiposition stapling ($1,679 list) 16-sheet booklet folder ($1,540 list) 5 x 150 ($800 list)	1 x 250 (standard)
Monthly duty cycle	100,000 pages	100,000 pages	10,000 pages
Warranty	1 year (depot)	1 year (depot)	Set by dealer
Year introduced	2004	2004	2004
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Model	*Lanier* *LP222cn* EDITOR'S CHOICE 2007	*Lanier* *LP226CN*	*Lanier* *LP231CN*
List price	$999	$1,199	$1,599
Street price (October 2006)	$699	$999	$1,399
Full-color print engine speed (pages per minute)	22ppm	26ppm	31ppm
Black-only print engine speed (pages per minute)	22ppm	26ppm	31ppm
First page out	*Black:* 14 seconds *Color:* 15 seconds	*Black:* 11 seconds *Color:* 16 seconds	*Black:* 11 seconds *Color:* 16 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	533MHz	600MHz	600MHz
Standard memory	128MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	20GB ($315 list)	40GB ($315 list)	40GB ($315 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 630	1 x 550	1 x 550
Optional paper supply	Up to 2 x 530 ($375 each, list)	2 x 550 ($390 each, street)	2 x 550 ($390 each, street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	Yes	Yes
Automatic duplex	Optional ($230 list)	Standard	Standard
Output devices	1 x 250 (standard)	1 x 500 (standard)	1 x 500 (standard)
Monthly duty cycle	50,000 pages	150,000 pages	150,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2006
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Model	*Lanier LP332cdn* EDITOR'S CHOICE 2007	*Lanier LP332cdtn* EDITOR'S CHOICE 2007	*Lanier LP335cdn*
List price	$3,795	$4,995	$5,095
Street price (October 2006)	$3,129	$3,949	$4,299
Full-color print engine speed (pages per minute)	28ppm	28ppm	35ppm
Black-only print engine speed (pages per minute)	32ppm	32ppm	35ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	733MHz	733MHz	733MHz
Standard memory	256MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB ($599 list)	40GB ($599 list)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	2 x 500	2 x 500	2 x 500
Optional paper supply	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	No	No	No
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,000)
Monthly duty cycle	200,000 pages	200,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2005	2005
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Model	*Lanier LP335cdtn*	*Lexmark C500n*	*Lexmark C530dn* EDITOR'S CHOICE 2007
List price	$5,995	$399	$499
Street price (October 2006)	$5,099	None	None
Full-color print engine speed (pages per minute)	35ppm	8ppm	22ppm
Black-only print engine speed (pages per minute)	35ppm	31ppm	24ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 13 seconds *Color:* 19 seconds	*Black:* 11seconds *Color:* 11 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Lexmark	Lexmark
Maximum resolution	1,200dpi	1,200 x 600dpi	1,200dpi
Processor	733MHz	200MHz	375MHz
Standard memory	256MB	64MB	128MB
Maximum memory	512MB	64MB	640MB
Hard drive	40GB (standard)	No	No
PostScript	PostScript 3 (standard)	No	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	No	No
Standard paper supply	3 x 500	1 x 250	1 x 250, 1 x 100
Optional paper supply	1 x 500 ($745 list) 1 x 2,000 ($1,245 list)	1 x 530	1 x 550 (price not available)
Bypass	1 x 100	No	
11" x 17" paper	Yes	No	No
110 lb. index	No	No	Yes
Automatic duplex	Standard	No	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,000)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	200,000 pages	35,000 pages	65,000 pages
Warranty	1 year (on site)	1 year (on site repair)	1 year (on site repair)
Year introduced	2005	2006	2006
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Model	*Lexmark C532n* EDITOR'S CHOICE 2007	*Lexmark C532dn* EDITOR'S CHOICE 2007	*Lexmark C534n* EDITOR'S CHOICE 2007
List price	$499	$699	$699
Street price (October 2006)	None	None	None
Full-color print engine speed (pages per minute)	22ppm	22ppm	22ppm
Black-only print engine speed (pages per minute)	24ppm	24ppm	24ppm
First page out	*Black:* 11 seconds *Color:* 11 seconds	*Black:* 11 seconds *Color:* 11 seconds	*Black:* 11 seconds *Color:* 11 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	375MHz	375MHz	625MHz
Standard memory	128MB	128MB	128MB
Maximum memory	640MB	640MB	640MB
Hard drive	No	No	40GB ($535 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250, 1 x 100	1 x 250, 1 x 100
Optional paper supply	1 x 550 ($411 street)	1 x 550 ($411, street)	1 x 550 ($411 street)
Bypass	No	No	No
11" x 17" paper	No	No	No
110 lb. index	No	Yes	Yes
Automatic duplex	No	Standard	No
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	75,000 pages	75,000 pages	100,000 pages
Warranty	1 year (on site repair)	1 year (on site repair)	1 year (on site repair)
Year introduced	2006	2006	2006
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Model	*Lexmark C534dn* EDITOR'S CHOICE 2007	*Lexmark C534dtn* EDITOR'S CHOICE 2007	*Lexmark C770n* EDITOR'S CHOICE 2007
List price	$999	$1,299	Not available
Street price (October 2006)	None	None	$999
Full-color print engine speed (pages per minute)	22ppm	22ppm	25ppm
Black-only print engine speed (pages per minute)	24ppm	24ppm	25ppm
First page out	*Black:* 11 seconds *Color:* 11 seconds	*Black:* 13 seconds *Color:* 13 seconds	*Black:* 13 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	1,200dpi	1,200dpi	4,800dpi (interpolated)
Processor	625MHz	625MHz	800MHz
Standard memory	256MB	256MB	256MB
Maximum memory	766MB	766MB	768MB
Hard drive	40GB ($535 street)	40GB ($535 street)	40GB ($535 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	Optional
Standard paper supply	1 x 250, 1 x 100	1 x 250, 1 x 500, 1 x 100	1 x 500
Optional paper supply	1 x 550 ($411 street)	1 x 550 ($411 street)	1 x 500 ($349 street)
Bypass	No	No	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	No	Yes
Automatic duplex	Standard	Standard	Optional ($699 street)
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard) 1 x 500 ($101 street) Banner tray ($499 street) Envelope drawer ($399 street) 1 x 750 25-sheet single-position stapling ($699 street) 1 x 750 StapleSmart finisher ($699 street) Output expander ($226 street) 5-bin mailbox ($439 street)
Monthly duty cycle	100,000 pages	100,000 pages	100,000 pages
Warranty	1 year (on site repair)	1 year (on site repair)	1 year (on site repair)
Year introduced	2006	2006	2006
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Model	*Lexmark C770dn* EDITOR'S CHOICE 2007	*Lexmark C770dtn* EDITOR'S CHOICE 2007	*Lexmark C772n* EDITOR'S CHOICE 2007
List price	Not available	Not available	Not available
Street price (October 2006)	$1,299	$1,549	$1,499
Full-color print engine speed (pages per minute)	25ppm	25ppm	25ppm
Black-only print engine speed (pages per minute)	25ppm	25ppm	25ppm
First page out	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 13 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	4,800dpi (interpolated)	4,800dpi (interpolated)	4,800dpi (interpolated)
Processor	800MHz	800MHz	800MHz
Standard memory	256MB	256MB	256MB
Maximum memory	768MB	768MB	768MB
Hard drive	40GB ($535 street)	40GB ($535 street)	40GB ($535 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 500	2 x 500	1 x 500
Optional paper supply	1 x 500 ($349 web)	Not available	1 x 500 ($349 web) 1 x 2,000 ($1,249 web)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	Optional ($699 street)
Output devices	1 x 250 (standard) 1 x 500 ($101 street) Banner tray ($499 street) Envelope drawer ($399 street) 1 x 750 25-sheet single-position stapling ($699 street) 1 x 750 StapleSmart finisher ($699 street) Output expander ($226 street) 5-bin mailbox ($439 street)	1 x 250 (standard) 1 x 500 ($101 street) Banner tray ($499 street) Envelope drawer ($399 street) 1 x 750 25-sheet single-position stapling ($699 street) 1 x 750 StapleSmart finisher ($699 street) Output expander ($226 street) 5-bin mailbox ($439 street)	1 x 250 (standard) 1 x 500 ($101 street) Banner tray ($499 street) Envelope drawer ($399 street) 1 x 750 25-sheet single-position stapling ($699 street) 1 x 750 StapleSmart finisher ($699 street) Output expander ($226 street) 5-bin mailbox ($439 street)
Monthly duty cycle	100,000 pages	100,000 pages	120,000 pages
Warranty	1 year (on site repair)	1 year (on site repair)	1 year (on site repair)
Year introduced	2006	2006	2006
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Model	*Lexmark C772dn* EDITOR'S CHOICE 2007	*Lexmark C772dtn* EDITOR'S CHOICE 2007	*Lexmark C920* EDITOR'S CHOICE 2007
List price	Not available	Not available	None
Street price (October 2006)	$1,799	$2,099	$3,299
Full-color print engine speed (pages per minute)	25ppm	25ppm	32ppm
Black-only print engine speed (pages per minute)	25ppm	25ppm	36ppm
First page out	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 13 seconds *Color:* 15 seconds	*Black:* 10 seconds *Color:* 14 seconds
Printing technology	Laser	Laser	LED
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	4,800dpi (interpolated)	4,800dpi (interpolated)	2,400dpi (interpolated)
Processor	800MHz	800MHz	1GHz
Standard memory	256MB	256MB	256MB
Maximum memory	768MB	768MB	1GB
Hard drive	40GB ($535 street)	40GB ($535 street)	40GB ($535 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Optional
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11g (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	No
Standard paper supply	1 x 500	2 x 500, 1 x 2,000	1 x 550
Optional paper supply	1 x 500 ($349 street) 1 x 2,000 ($1,249 street)	No	1 x 550 ($561 street) 2 x 550 ($1,249 street) 1 x 3,000 ($1,311 street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	Yes
110 lb. index	Yes	Yes	No
Automatic duplex	Standard	Standard	Optional ($686 street)
Output devices	1 x 250 (standard) 1 x 500 ($101 street) Banner tray ($499 street) Envelope drawer ($399 street) 1 x 750 25-sheet single-position stapling ($699 street) 1 x 750 StapleSmart finisher ($699 street) Output expander ($226 street) 5-bin mailbox ($439 street)	1 x 250 (standard) 1 x 500 ($101 street) Banner tray ($499 street) Envelope drawer ($399 street) 1 x 750 25-sheet single-position stapling ($699 street) 1 x 750 StapleSmart finisher ($699 street) Output expander ($226 street) 5-bin mailbox ($439 street)	1 x 100, 1 x 550 (standard) 1 x 1,000 with 30-sheet stapling and 3/4-hole punch ($1,999, street)
Monthly duty cycle	120,000 pages	120,000 pages	200,000 pages
Warranty	1 year (on site repair)	1 year (on site repair)	1 year (on site repair)
Year introduced	2006	2006	2005
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Model	*Lexmark C920n* EDITOR'S CHOICE 2007	*Lexmark C920dn* EDITOR'S CHOICE 2007	*Lexmark C920dtn* EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$3,549	$3,749	$4,999
Full-color print engine speed (pages per minute)	32ppm	32ppm	32ppm
Black-only print engine speed (pages per minute)	36ppm	36ppm	36ppm
First page out	*Black:* 10 seconds *Color:* 14 seconds	*Black:* 10 seconds *Color:* 14 seconds	*Black:* 10 seconds *Color:* 14 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Lexmark	Lexmark	Lexmark
Maximum resolution	2,400dpi (interpolated)	2,400dpi (interpolated)	2,400dpi (interpolated)
Processor	1GHz	1GHz	1GHz
Standard memory	256MB	256MB	256MB
Maximum memory	1GB	1GB	1GB
Hard drive	40GB ($535 street)	40GB ($535 street)	40GB ($535 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11g (optional)	IEEE 802.11g (optional)	IEEE 802.11g (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 550	1 x 550	2 x 550
Optional paper supply	1 x 550 ($561 web) 2 x 550 ($1,249 web) 1 x 3,000 ($1,311 web)	1 x 550 ($561 web) 2 x 550 ($1,249 web) 1 x 3,000 ($1,311 web)	1 x 550 ($561 web) 2 x 550 ($1,249 web) 1 x 3,000 ($1,311 web)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	No	No	No
Automatic duplex	Optional ($686 street)	Standard	Standard
Output devices	1 x 100, 1 x 550 (standard) 1 x 1,000 with 30-sheet stapling and 3/4-hole punch ($1,999 street)	1 x 100, 1 x 550 (standard) 1 x 1,000 with 30-sheet stapling and 3/4-hole punch ($1,999 street)	1 x 100, 1 x 550 (standard) 1 x 1,000 with 30-sheet stapling and 3/4-hole punch ($1,999 street)
Monthly duty cycle	200,000 pages	200,000 pages	200,000 pages
Warranty	1 year (on site repair)	1 year (on site repair)	1 year (on site repair)
Year introduced	2005	2005	2005
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Model	*OKI Printing Solutions C3400n* EDITOR'S CHOICE 2007	*OKI Printing Solutions C5500n* EDITOR'S CHOICE 2007	*OKI Printing Solutions C5800Ldn* EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$399	$599	$799
Full-color print engine speed (pages per minute)	16ppm	20ppm	24ppm
Black-only print engine speed (pages per minute)	20ppm	24ppm	28ppm
First page out	*Black:* 9 seconds *Color:* 13 seconds	*Black:* 10 seconds *Color:* 11 seconds	*Black:* 10 seconds *Color:* 11 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Oki Data	Oki Data	Oki Data
Maximum resolution	1,200 x 600dpi (interpolated)	1,200 x 600dpi (interpolated)	1,200 x 600dpi (interpolated)
Processor	200MHz	200MHz	200MHz
Standard memory	32MB	64MB	128MB
Maximum memory	288MB	320MB	320MB
Hard drive	Not available	Not available	Not available
PostScript	Not available	Not available	Not available
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 400	1 x 400
Optional paper supply	No	1 x 530 ($229 street)	1 x 530 ($229 street)
Bypass	No	No	No
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Not available	Optional ($179 street)	Standard
Output devices	Not available	Not available	Not available
Monthly duty cycle	35,000 pages	60,000 pages	60,000 pages
Warranty	1 year (exchange)	1 year (exchange) 5 years limited on LED printhead	1 year (exchange) 5 years limited on LED printhead
Year introduced	2006	2006	2006
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Model	OKI Printing Solutions C7350n	OKI Printing Solutions C7350hdn	OKI Printing Solutions C7550n
List price	None	None	None
Street price (October 2006)	$1,669	$1,669	$1,516
Full-color print engine speed (pages per minute)	24ppm	24ppm	24ppm
Black-only print engine speed (pages per minute)	26ppm	26ppm	26ppm
First page out	*Black:* 8 seconds *Color:* 9 seconds	*Black:* 8 seconds *Color:* 9 seconds	*Black:* 8 seconds *Color:* 9 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Oki Data	Oki Data	Oki Data
Maximum resolution	1,200 x 600dpi	1,200 x 600dpi	1,200dpi
Processor	500MHz	500MHz	500MHz
Standard memory	192MB	320MB	192MB
Maximum memory	1,024MB	1,024MB	1,024MB
Hard drive	20GB (price not available)	20GB (standard)	20GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 530	1 x 530	1 x 530
Optional paper supply	2 x 530 ($495 each, list)	2 x 530 ($495 each, list)	2 x 530 ($495 each, list)
Bypass	100 sheets	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Optional ($395 list)	Standard	Optional ($395 list)
Output devices	1 x 100, 1 x 500 (standard)	1 x 100, 1 x 500 (standard)	1 x 100, 1 x 500 (standard)
Monthly duty cycle	100,000 pages	100,000 pages	100,000 pages
Warranty	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head
Year introduced	2004	2004	2004
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Model	*OKI Printing Solutions C7550hdn*	*OKI Printing Solutions C6100n*	*OKI Printing Solutions C6100dn*
List price	None	None	None
Street price (October 2006)	$2,029	$899	$1,049
Full-color print engine speed (pages per minute)	24ppm	26ppm	26ppm
Black-only print engine speed (pages per minute)	26ppm	32ppm	32ppm
First page out	*Black:* 8 seconds *Color:* 9 seconds	*Black:* 9 seconds *Color:* 11 seconds	*Black:* 9 seconds *Color:* 11 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Oki Data	Oki Data	Oki Data
Maximum resolution	1,200dpi	1,200 x 600dpi (interpolated)	1,200 x 600dpi (interpolated)
Processor	500MHz	500MHz	500MHz
Standard memory	192MB	256MB	256MB
Maximum memory	1,024MB	768MB	768MB
Hard drive	20GB (standard)	40GB (price not available)	40GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 530	1 x 400	1 x 400
Optional paper supply	2 x 530 ($495 each, list)	1 x 530 ($229 list)	1 x 530 ($229 list)
Bypass	1 x 100	No	No
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Optional ($179 list)	Standard
Output devices	1 x 100, 1 x 500 (standard)	Not available	Not available
Monthly duty cycle	100,000 pages	60,000 pages	60,000 pages
Warranty	1 year (on site) 5 years limited on LED printhead	1 year (exchange) 5 years limited on LED printhead	1 year (exchange) 5 years limited on LED printhead
Year introduced	2004	2006	2006
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Model	OKI Printing Solutions C6100dtn	OKI Printing Solutions C6100hdn	OKI Printing Solutions C9600n
List price	None	None	None
Street price (October 2006)	$1,249	$1,399	$3,399
Full-color print engine speed (pages per minute)	26ppm	26ppm	36ppm
Black-only print engine speed (pages per minute)	32ppm	32ppm	40ppm
First page out	*Black:* 9 seconds *Color:* 11 seconds	*Black:* 9 seconds *Color:* 11 seconds	*Black:* 9 seconds *Color:* 11 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Oki Data	Oki Data	Oki Data
Maximum resolution	1,200 x 600dpi (interpolated)	1,200 x 600dpi (interpolated)	1,200 x 600dpi
Processor	500MHz	500MHz	720MHz
Standard memory	256MB	256MB	256MB
Maximum memory	768MB	768MB	1GB
Hard drive	40GB (price not available)	40GB (standard)	20GB (price not available)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 400, 1 x 530	1 x 400	1 x 550
Optional paper supply	None	1 x 530 ($229 list)	2 x 550 ($529 list) 1 x 1,590 ($1,379 list)
Bypass	No	No	1 x 100
11" x 17" paper	No	No	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	Optional ($425 list)
Output devices	Not available	Not available	1 x 100, 1 x 500 (standard) 2/3-hole punch ($369 list) 4 x 250 saddlestitch finisher ($3,189 list) 5 x 200 saddlestitch finisher ($3,811 list)
Monthly duty cycle	60,000 pages	60,000 pages	150,000 pages
Warranty	1 year (exchange) 5 years limited on LED printhead	1 year (exchange) 5 years limited on LED printhead	1 year (on site) 5 years limited on LED printhead
Year introduced	2006	2006	2005
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Model	*OKI Printing Solutions C9600hdn*	*OKI Printing Solutions C9800hn*	*OKI Printing Solutions C9800hdn*
List price	None	None	None
Street price (October 2006)	$4,009	$6,889	$7,189
Full-color print engine speed (pages per minute)	36ppm	36ppm	36ppm
Black-only print engine speed (pages per minute)	40ppm	40ppm	40ppm
First page out	*Black:* 9 seconds *Color:* 11 seconds	*Black:* 9 seconds *Color:* 11 seconds	*Black:* 9 seconds *Color:* 11 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Oki Data	Oki Data	Oki Data
Maximum resolution	1,200 x 600dpi	1,200 x 600dpi	1,200 x 600dpi
Processor	720MHz	1GHz	1GHz
Standard memory	324MB	1GB	1GB
Maximum memory	1GB	1GB	1GB
Hard drive	20GB (standard)	20GB (standard)	20GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 550	1 x 550	1 x 550
Optional paper supply	2 x 550 ($529 list) 1 x 1,650 ($1,299 list) 1 x 1,590 ($1,379 list)	2 x 550 ($529 list) 1 x 1,590 ($1,379 list)	2 x 550 ($529 list) 1 x 1,590 ($1,379 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Optional ($425 list)	Standard
Output devices	1 x 100, 1 x 500 (standard) 2/3-hole punch ($369 list) 4 x 250 saddlestitch finisher ($3,189 list) 5 x 200 saddlestitch finisher ($3,811 list)	1 x 100, 1 x 500 (standard) 2/3-hole punch ($369 list) 4 x 250 saddlestitch finisher ($3,189 list) 5 x 200 saddlestitch finisher ($3,811 list)	1 x 100, 1 x 500 (standard) 2/3-hole punch ($369 list) 4 x 250 saddlestitch finisher ($3,189 list) 5 x 200 saddlestitch finisher ($3,811 list)
Monthly duty cycle	150,000 pages	150,000 pages	150,000 pages
Warranty	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head
Year introduced	2005	2005	2005
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Model	*Panasonic WORKiO KX-CL400*	*Panasonic WORKiO DP-CL18*	*Panasonic WORKiO DP-CL22*
List price	$1,149	$1,149	$1,499
Street price (October 2006)	$899	$899	$1,199
Full-color print engine speed (pages per minute)	18ppm	18ppm	22ppm
Black-only print engine speed (pages per minute)	18ppm	18ppm	22ppm
First page out	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 14 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Matsushita	Matsushita	Matsushita
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	400MHz	400MHz	600MHz
Standard memory	128MB	128MB	128MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB ($299 list)	40GB ($299 list)	40GB ($299 list)
PostScript	PostScript 3 (optional)	PostScript 3 (optional)	PostScript 3 (optional)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional, third-party)	IEEE 802.11b (optional, third-party)	IEEE 802.11b (optional, third-party)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 530	1 x 530	1 x 530
Optional paper supply	2 x 530 ($449 each, list)	2 x 530 ($449 each, list)	2 x 530 ($449 each, list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Bypass	Bypass	Bypass
Automatic duplex	Optional ($199 list)	Standard	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	Not available	Not available	Not available
Warranty	1 year (advance exchange)	Set by dealer	Set by dealer
Year introduced	2005	2005	2005
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Model	*Ricoh* *Aficio CL1000N*	*Ricoh* *Aficio CL3500N* EDITOR'S CHOICE 2007	*Ricoh* *Aficio SP C410DN*
List price	$899	$999	$1,199
Street price (October 2006)	$699	$699	$999
Full-color print engine speed (pages per minute)	8ppm	22ppm	26ppm
Black-only print engine speed (pages per minute)	31ppm	22ppm	26ppm
First page out	*Black:* 14 seconds *Color:* 20 seconds	*Black:* 14 seconds *Color:* 15 seconds	*Black:* 10 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200 x 600dpi	1,200dpi	1,200dpi
Processor	300MHz	533MHz	600MHz
Standard memory	128MB	128MB	256MB
Maximum memory	384MB	512MB	512MB
Hard drive	10GB ($400 list)	20GB ($315 list)	40GB ($315 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 250	1 x 630	1 x 550
Optional paper supply	1 x 530 ($350 list)	Up to 2 x 530 ($375 each, list)	2 x 550 ($390 each, street)
Bypass	No	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	No	Yes
Automatic duplex	Optional ($230 list)	Optional ($230 list)	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 500 (standard)
Monthly duty cycle	10,000 pages	50,000 pages	150,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2004	2006	2006
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Model	Ricoh Aficio SP C411DN	Ricoh Aficio CL7200 EDITOR'S CHOICE 2007	Ricoh Aficio CL7200D EDITOR'S CHOICE 2007
List price	$1,599	$3,495	$3,795
Street price (October 2006)	$1,399	$2,899	$3,129
Full-color print engine speed (pages per minute)	31ppm	28ppm	28ppm
Black-only print engine speed (pages per minute)	31ppm	32ppm	32ppm
First page out	*Black:* 10 seconds *Color:* 15 seconds	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	600MHz	733MHz	733MHz
Standard memory	256MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB ($315 list)	40GB ($599 list)	40GB ($599 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 550	2 x 500	2 x 500
Optional paper supply	2 x 550 ($390 each, street)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	Yes	Yes
110 lb. index	Yes	No	No
Automatic duplex	Standard	Optional ($300 list)	Standard
Output devices	1 x 500 (standard)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling & booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling & booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)
Monthly duty cycle	150,000 pages	200,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2005	2005
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Model	*Ricoh Aficio CL7200DT1* EDITOR'S CHOICE 2007	*Ricoh Aficio CL7200DT2* EDITOR'S CHOICE 2007	*Ricoh Aficio CL7200DL* EDITOR'S CHOICE 2007
List price	$4,995	$5,695	$5,695
Street price (October 2006)	$3,949	$4,399	$4,399
Full-color print engine speed (pages per minute)	28ppm	28ppm	28ppm
Black-only print engine speed (pages per minute)	32ppm	32ppm	32ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color*: 12 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	733MHz	733MHz	733MHz
Standard memory	256MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB (standard)	40GB (standard)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	3 x 500	4 x 500	2 x 500, 1 x 2,000
Optional paper supply	1 x 500 ($745 list) 1 x 2,000 ($1,245 list)	1 x 2,000 ($1,245 list)	No
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	No	No	No
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)
Monthly duty cycle	200,000 pages	200,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2005	2005
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Model	*Ricoh GX3000* EDITOR'S CHOICE 2007	*Ricoh GX3050N* EDITOR'S CHOICE 2007	*Ricoh GX5050N* EDITOR'S CHOICE 2007
List price	Not available	Not available	Not available
Street price (October 2006)	$199	$279	$369
Full-color print engine speed (pages per minute)	29ppm	29ppm	30ppm
Black-only print engine speed (pages per minute)	29ppm	29ppm	30ppm
First page out	*Black:* 9 seconds *Color:* 9 seconds	*Black:* 9 seconds *Color:* 9 seconds	*Black:* 6 seconds *Color:* 6 seconds
Printing technology	GelSprinter	GelSprinter	GelSprinter
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	3,600 x 1,200dpi (interpolated)	3,600 x 1,200dpi (interpolated)	3,600 x 1,200dpi (interpolated)
Processor	200MHz	400MHz	400MHz
Standard memory	32MB	64MB	64MB
Maximum memory	32MB	64MB	64MB
Hard drive	No	No	No
PostScript	No	No	No
Ethernet	Optional	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	No	No	1 x 500 (price not available)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	No	No	No
Output devices	1 x 150 (standard)	1 x 150 (standard)	1 x 150 (standard)
Monthly duty cycle	10,000 pages	10,000 pages	10,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2006
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Model	*Ricoh Aficio CL7300D*	*Ricoh Aficio CL7300DT1*	*Ricoh Aficio CL7300DT2*
List price	$5,095	$5,995	$6,740
Street price (October 2006)	$4,299	$5,099	$5,699
Full-color print engine speed (pages per minute)	35ppm	35ppm	35ppm
Black-only print engine speed (pages per minute)	35ppm	35ppm	35ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	733MHz	733MHz	733MHz
Standard memory	256MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB (standard)	40GB (standard)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	2 x 500	3 x 500	4 x 500
Optional paper supply	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)	1 x 500 ($745 list) 1 x 2,000 ($1,245 list)	1 x 2,000 ($1,245 list)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	Yes	Yes
110 lb. index	No	No	No
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)
Monthly duty cycle	200,000 pages	200,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2005	2005
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Model	*Ricoh Aficio CL7300DL*	*RISO G752*	*RISO G912*
List price	$6,740	$3,299	$6,049
Street price (October 2006)	$5,699	Set by dealer	Set by dealer
Full-color print engine speed (pages per minute)	35ppm	20ppm	28ppm
Black-only print engine speed (pages per minute)	35ppm	20ppm	28ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 15 seconds *Color:* 18 seconds	*Black:* 15 seconds *Color:* 15 seconds
Printing technology	Laser	Laser	LED
Engine manufacturer	Ricoh	Lexmark	Lexmark
Maximum resolution	1,200dpi	2,400 x 600dpi	2,400 x 600dpi
Processor	733MHz	600MHz	600MHz
Standard memory	256MB	256MB	256MB
Maximum memory	512MB	512MB	512MB
Hard drive	40GB (standard)	5GB (price set by dealer)	20GB (price set by dealer)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional)	IEEE 802.11g (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	4 x 500, 1 x 2,000	2 x 500	2 x 550
Optional paper supply	No	1 x 500 (price set by dealer) 1 x 2,000 (price set by dealer)	1 x 550 (price set by dealer) 2 x 550 (price set by dealer) 1 x 3,000 (price set by dealer)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	Yes	No	Yes
110 lb. index	No	Yes	Yes
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	1 x 250 (standard) 1 x 650 (price set by dealer) 1 x 3,000 with 30-sheet stapling (price set by dealer) 5 x 100 mailbox (price set by dealer)	1 x 100, 1 x 550 (standard) 1 x 1,100 with 30-sheet stapling and 3/4-hole punch (price set by dealer)
Monthly duty cycle	200,000 pages	85,000 pages	100,000 pages
Warranty	1 year (on site)	Set by dealer	Set by dealer
Year introduced	2005	2004	2004
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Model	*Samsung* *CLP-510*	*Samsung* *CLP-510N*	*Samsung* *CLP-550*
List price	None	None	None
Street price (October 2006)	$400	$500	$575
Full-color print engine speed (pages per minute)	5ppm	5ppm	5ppm
Black-only print engine speed (pages per minute)	25ppm	25ppm	21ppm
First page out	*Black:* 13 seconds *Color:* 21 seconds	*Black:* 13 seconds *Color:* 21 seconds	*Black:* 15 seconds *Color:* 24 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Samsung	Samsung	Samsung
Maximum resolution	1,200dpi (interpolated)	1,200dpi (interpolated)	1,200dpi (interpolated)
Processor	266MHz	266MHz	266MHz
Standard memory	64MB	64MB	64MB
Maximum memory	192MB	192MB	320MB
Hard drive	No	No	No
PostScript	No	No	PostScript 3 (standard)
Ethernet	Optional	Standard	Optional
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	1 x 500 ($273 street)	1 x 500 ($273 street)	1 x 500 ($273 street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	35,000 pages	35,000 pages	35,000 pages
Warranty	1 year (exchange)	1 year (exchange)	1 year (exchange)
Year introduced	2005	2005	2004
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Model	Samsung CLP-550N	Samsung CLP-600N EDITOR'S CHOICE 2007	Samsung CLP-650N EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$671	$499	$699
Full-color print engine speed (pages per minute)	5ppm	21ppm	21ppm
Black-only print engine speed (pages per minute)	21ppm	21ppm	21ppm
First page out	*Black:* 15 seconds *Color:* 24 seconds	*Black:* 16 seconds *Color:* 16 seconds	*Black:* 20 seconds *Color:* 20 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Samsung	Samsung	Samsung
Maximum resolution	600dpi, 1,200dpi (interpolated)	2,400 x 600dpi (interpolated)	2,400 x 600dpi (interpolated)
Processor	266MHz	600MHz	600MHz
Standard memory	128MB	32MB	256MB
Maximum memory	384MB	32MB	512MB
Hard drive	No	No	No
PostScript	PostScript 3 (standard)	No	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 250	1 x 250	1 x 250
Optional paper supply	1 x 500 ($273 street)	1 x 500 ($249 street)	1 x 500 ($249 street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	No	No	No
Automatic duplex	Standard	No	No
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	35,000 pages	45,000	45,000
Warranty	1 year (exchange)	1 year (on site)	1 year (on site)
Year introduced	2004	2006	2006
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Model	*Savin* *CLP22* EDITOR'S CHOICE 2007	*Savin* *CLP831*	*Savin* *CLP128* EDITOR'S CHOICE 2007
List price	$999	$899	$3,495
Street price (October 2006)	$699	$699	$2,899
Full-color print engine speed (pages per minute)	22ppm	8ppm	28ppm
Black-only print engine speed (pages per minute)	22ppm	31ppm	32ppm
First page out	*Black:* 14 seconds *Color:* 15 seconds	*Black:* 14 seconds *Color:* 20 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Ricoh	Ricoh	Ricoh
Maximum resolution	1,200dpi	1,200 x 600dpi	1,200dpi
Processor	533MHz	300MHz	733MHz
Standard memory	128MB	128MB	256MB
Maximum memory	512MB	384MB	512MB
Hard drive	20GB ($315 list)	10GB ($400 list)	40GB ($599 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)	IEEE 802.11b (optional) Bluetooth (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	Optional	Optional
Standard paper supply	1 x 630	1 x 250	2 x 500
Optional paper supply	Up to 2 x 530 ($375 each, list)	1 x 530 ($350 list)	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)
Bypass	1 x 100	No	1 x 100
11" x 17" paper	No	No	Yes
110 lb. index	No	Yes	No
Automatic duplex	Optional ($230 list)	Optional ($230 list)	Optional ($300 list)
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)
Monthly duty cycle	50,000 pages	10,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2004	2005
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Model	*Savin CLP135 D*	*Sharp AR-C240P*	*Sharp AR-C260P*
List price	$5,095	$2,999	$5,795
Street price (October 2006)	$4,299	Set by dealer	Set by dealer
Full-color print engine speed (pages per minute)	35ppm	24ppm	26ppm
Black-only print engine speed (pages per minute)	35ppm	26ppm	32ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	Not published	Not published
Printing technology	Laser	LED	LED
Engine manufacturer	Ricoh	OKI	OKI
Maximum resolution	1,200dpi	1,200 x 600dpi (interpolated)	600dpi
Processor	733MHz	500 MHz	500 MHz
Standard memory	256MB	192MB	128MB
Maximum memory	512MB	1GB	640MB
Hard drive	40GB (standard)	20GB	40GB
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional) Bluetooth (optional)	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	Optional	No	No
Standard paper supply	2 x 500	1 x 530	1 x 500
Optional paper supply	2 x 500 ($745 each, or $1,245 both, list) 1 x 2,000 ($1,245 list)	1 x 530 ($520)	1 x 500 ($1,095) 2 x 500 with duplex ($1,450) 3 x 500 ($1,395) 1 x 3,000 ($1,395)
Bypass	1 x 100	1 x 100	1 x 250
11" x 17" paper	Yes	No	Yes
110 lb. index	No	Yes	Yes
Automatic duplex	Standard	Optional ($425 list)	Optional ($550 list)
Output devices	1 x 100, 1 x 500 (standard) 1 x 2,000 with 50-sheet multiposition stapling ($2,700 street) 1 x 1,000 with 50-sheet multiposition stapling and booklet maker with saddlestitcher ($3,400 list) 2/3-hole punch ($765 list; requires 1 x 2,500)	Not available	1 x 1,000 finisher with saddle-stitch and 3-position stapling ($3,095) 2/3 hole-punch for finisher ($695)
Monthly duty cycle	200,000 pages	100,000 pages	48,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2005	2004	2004
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Model	*Sharp AR-C265P*	*Sharp AR-C360P*	*TallyGenicom 8008*
List price	Not available	$13,995	$775
Street price (October 2006)	Not available	Set by dealer	Set by dealer
Full-color print engine speed (pages per minute)	26ppm	36ppm	8ppm
Black-only print engine speed (pages per minute)	32ppm	40ppm	31ppm
First page out	Not published	Not published	*Black:* 13 seconds *Color:* 19 seconds
Printing technology	LED	LED	Laser
Engine manufacturer	OKI	OKI	Not available
Maximum resolution	1,200 x 600dpi (interpolated)	1,200dpi	1,200 x 600dpi
Processor	500 MHz	1GHz	170MHz
Standard memory	1GB	256MB	64MB
Maximum memory	1GB	768MB	64MB
Hard drive	20GB	40GB	No
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	No
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 300	1 x 300	1 x 250
Optional paper supply	1 x 530	1 x 530 3 x 530	1 x 500 ($125 list)
Bypass	1 x 100	1 x 230	No
11" x 17" paper	Yes	Yes	No
110 lb. index	Yes	Yes	No
Automatic duplex	Optional ($550 list)	Standard	Optional ($799 list)
Output devices	Not available	1 x 500 (standard) 1 x 1,000 finisher with saddle-stitch and 3-position stapling ($3,095) 2/3 hole-punch for finisher ($695)	1 x 250 (standard)
Monthly duty cycle	150,000 pages	Not published	30,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2005	2004
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Model	*TallyGenicom 8026*	*Toshiba e-STUDIO205CP*	*Toshiba e-STUDIO360CP* EDITOR'S CHOICE 2007
List price	$1,099	$999	$3,549
Street price (October 2006)	$999	Set by dealer	Not available
Full-color print engine speed (pages per minute)	26ppm	20ppm	32ppm
Black-only print engine speed (pages per minute)	36ppm	20ppm	36ppm
First page out	*Black:* 8 seconds *Color:* 8 seconds	*Black:* 13 seconds *Color:* 13 seconds	*Black:* 10 seconds *Color:* 14 seconds
Printing technology	Laser	Laser	LED
Engine manufacturer	Fuji Xerox	Lexmark	Lexmark
Maximum resolution	1,200dpi	4,800dpi (interpolated)	2,400dpi
Processor	533MHz	500MHz	1GHz
Standard memory	128MB	128MB	256MB
Maximum memory	256MB	640MB	1GB
Hard drive	4GB (price not available)	20GB ($535 list)	20GB ($535 list)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	IEEE 802.11b (optional)	IEEE 802.11g (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 500	1 x 250	1 x 550
Optional paper supply	1 x 500 2 x 550	1 x 500 ($299)	1 x 550 ($561) 2 x 550 ($1,249) 1 x 3,000 ($1,311)
Bypass	1 x 150	1 x 100	1 x 100
11" x 17" paper	No	No	Yes
110 lb. index	Bypass	No	No
Automatic duplex	Standard	Standard	Optional ($686)
Output devices	1 x 250	Not available	1 x 1,100 finisher with 30-sheet stapling and 3-hole punch ($1,999)
Monthly duty cycle	100,000 pages	65,000 pages	200,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (on site)
Year introduced	2006	2006	2006
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Model	*Unisys* *UDS 579-DN1* EDITOR'S CHOICE 2007	*Xanté* *Ilumina*	*Xerox* *Phaser 6120N*
List price	$2,955	$6,495	None
Street price (October 2005)	None	Set by dealer	$299 (after instant rebate)
Full-color print engine speed (pages per minute)	25ppm	36ppm	5ppm
Black-only print engine speed (pages per minute)	25ppm	40ppm	20ppm
First page out	*Black:* 15 seconds *Color:* 15 seconds	Not available	*Black:* 13 seconds *Color:* 22 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Lexmark	Oki Data	Konica Minolta
Maximum resolution	4,800dpi (interpolated)	1,200 x 600 dpi	2,400dpi (interpolated)
Processor	600MHz	720MHz	300MHz
Standard memory	128MB	512MB	128MB
Maximum memory	512MB	1GB	640MB
Hard drive	20GB ($689 list)	20GB (standard)	20GB ($299 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	No	IEEE 802.11b (optional)
USB interface	Standard	Standard	Yes
Integrated copy function	No	No	No
Standard paper supply	1 x 500	1 x 530	1 x 200
Optional paper supply	Up to 3 x 500 ($522 each, list) 1 x 2,000 ($1,609 list)	4 x 530 ($495 each, list) 1 x 1,590 ($1,499 list)	1 x 500 ($299 street)
Bypass	1 x 100	1 x 230	No
11" x 17" paper	No	Yes	No
110 lb. index	Yes	Bypass	Yes
Automatic duplex	Standard	Standard	Optional ($399 street)
Output devices	1 x 250 (standard) 1 x 640 ($279 list) 5 x 100 mailbox ($549 list) 1 x 2,000 with 30-sheet stapling, offsetting, and 2/3/4-hole punch ($3,229 list)	1 x 530 (standard)	1 x 200 (standard)
Monthly duty cycle	70,000 pages	150.000 pages	35,000 pages
Warranty	1 year (on site)	1 year (on site)	1 year (quick exchange) + Total Satisfaction Guarantee
Year introduced	2005	2005	2005
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Model	*Xerox Phaser 8500N*	*Xerox Phaser 8500DN*	*Xerox Phaser 8550DP*
List price	None	None	None
Street price (October 2006)	$899	$1,099	$1,299
Full-color print engine speed (pages per minute)	24ppm	24ppm	30ppm
Black-only print engine speed (pages per minute)	24ppm	24ppm	30ppm
First page out	*Black:* 6 seconds *Color:* 6 seconds	*Black:* 6 seconds *Color:* 6 seconds	*Black:* 5 seconds *Color:* 5 seconds
Printing technology	Solid ink	Solid ink	Solid ink
Engine manufacturer	Xerox	Xerox	Xerox
Maximum resolution	1,200dpi (interpolated)	1,200dpi (interpolated)	2,400dpi (interpolated)
Processor	600MHz	600MHz	600MHz
Standard memory	128MB	128MB	256MB
Maximum memory	512MB	512MB	1GB
Hard drive	No	No	20GB ($499 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	No
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 525	1 x 525	1 x 525
Optional paper supply	2 x 525 ($399 each, street)	2 x 525 ($399 each, street)	2 x 525 ($399 each, street)
Bypass	1 x 100	1 x 100	1 x 100
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	No	Standard	Standard
Output devices	1 x 300 (standard)	1 x 300 (standard)	1 x 300 (standard)
Monthly duty cycle	85,000 pages	85,000 pages	85,000 pages
Warranty	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee
Year introduced	2005	2005	2005
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Model	*Xerox Phaser 8550DT*	*Xerox Phaser 8550DX*	*Xerox Phaser 6300N*
List price	None	None	None
Street price (October 2006)	$1,599	$2,399	$1,299
Full-color print engine speed (pages per minute)	30ppm	30ppm	26ppm
Black-only print engine speed (pages per minute)	30ppm	30ppm	36ppm
First page out	*Black:* 5 seconds *Color:* 5 seconds	Black: 5 seconds *Color:* 5 seconds	*Black:* 12 seconds *Color:* 12 seconds
Printing technology	Solid ink	Solid ink	Laser
Engine manufacturer	Xerox	Xerox	Xerox
Maximum resolution	2,400dpi (interpolated)	2,400dpi (interpolated)	2,400dpi
Processor	600MHz	600MHz	800MHz
Standard memory	256MB	512MB	256MB
Maximum memory	1GB	1GB	1GB
Hard drive	20GB ($499 street)	20GB (standard)	20GB ($499 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	No	No	Optional
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	2 x 525	3 x 525	1 x 550
Optional paper supply	1x 525 ($399 street)	No	1 x 550 ($399 street) 2 x 550 ($599 street)
Bypass	1 x 100	1 x 100	1 x 150
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	No
Output devices	1 x 300 (standard)	1 x 300 (standard)	1 x 250 (standard)
Monthly duty cycle	85,000 pages	85,000 pages	100,000 pages
Warranty	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee
Year introduced	2005	2005	2005
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Model	*Xerox Phaser 6300DN*	*Xerox Phaser 6350DP*	*Xerox Phaser 6350DT*
List price	None	None	None
Street price (October 2006)	$1,499	$1,799	$2,549
Full-color print engine speed (pages per minute)	26ppm	36ppm	36ppm
Black-only print engine speed (pages per minute)	36ppm	36ppm	36ppm
First page out	*Black:* 12 seconds *Color:* 12 seconds	*Black:* 10 seconds *Color:* 10 seconds	*Black:* 10 seconds *Color:* 10 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Xerox	Xerox	Xerox
Maximum resolution	2,400dpi	2,400dpi	2,400dpi
Processor	800MHz	800MHz	800MHz
Standard memory	256MB	256MB	512MB
Maximum memory	1GB	1GB	1GB
Hard drive	20GB ($499 street)	20GB ($499 street)	20GB ($499 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 550	1 x 550	2 x 550
Optional paper supply	1 x 550 ($399 street) 2 x 550 ($599 street)	1 x 550 ($399 street) 2 x 550 ($599 street)	1 x 1,100 ($399 street)
Bypass	1 x 150	1 x 150	1 x 150
11" x 17" paper	No	No	No
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 250 (standard)	1 x 250 (standard)	1 x 250 (standard)
Monthly duty cycle	100,000 pages	120,000 pages	120,000 pages
Warranty	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee
Year introduced	2005	2005	2005
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Model	*Xerox Phaser 6350DX*	*Xerox Phaser 7400N*	*Xerox Phaser 7400DN*
List price	None	None	None
Street price (October 2006)	$3,149	$2,999	$3,349
Full-color print engine speed (pages per minute)	36ppm	36ppm	36ppm
Black-only print engine speed (pages per minute)	36ppm	40ppm	40ppm
First page out	*Black:* 10 seconds *Color:* 10 seconds	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	Laser	LED	LED
Engine manufacturer	Xerox	Oki Data	Oki Data
Maximum resolution	2,400dpi	1,200dpi	1,200dpi
Processor	800MHz	800MHz	800MHz
Standard memory	512MB	256MB	256MB
Maximum memory	1GB	1GB	1GB
Hard drive	20GB (standard)	40GB ($499 street)	40GB ($499 street)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	3 x 550	1 x 550	1 x 550
Optional paper supply	1 x 1,100 ($399 street)	1 x 550 ($499 street) 1 x 1,650 (price not available)	1 x 550 ($499 street) 1 x 1,650 ($1,199 street)
Bypass	1 x 150	1 x 250	1 x 250
11" x 17" paper	No	Yes	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Optional ($399 street)	Standard
Output devices	1 x 250 (standard)	1 x 100, 1 x 500 (standard) 1 x 1,100 with 20-sheet multiposition stapling and 2/3-hole punch ($2,999, includes 550-sheet paper tray)	1 x 250, 1 x 500 (standard) 1 x 1,000 with 50-sheet multiposition stapling and 3/4-hole punch ($2,999, includes 550-sheet paper tray)
Monthly duty cycle	120,000 pages	150,000 pages	150,000 pages
Warranty	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head
Year introduced	2005	2005	2005
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Model	Xerox Phaser 7400DT	Xerox Phaser 7400DX	Xerox Phaser 7400DXF
List price	None	None	None
Street price (October 2006)	$4,599	$5,499	$7,999
Full-color print engine speed (pages per minute)	36ppm	36ppm	36ppm
Black-only print engine speed (pages per minute)	40ppm	40ppm	40ppm
First page out	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds	*Black:* 11 seconds *Color:* 12 seconds
Printing technology	LED	LED	LED
Engine manufacturer	Oki Data	Oki Data	Oki Data
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	800MHz	800MHz	800MHz
Standard memory	512MB	512MB	512MB
Maximum memory	1GB	1GB	1GB
Hard drive	40GB (standard)	40GB (standard)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	2 x 550	1 x 550, 1 x 1,650	1 x 550, 1 x 1,650
Optional paper supply	1 x 1,650 ($1,199 street)	1 x 550 ($499 street)	No
Bypass	1 x 250	1 x 250	1 x 250
11" x 17" paper	Yes	Yes	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 250, 1 x 500 (standard) 1 x 1,000 with 50-sheet multiposition stapling and 3/4-hole punch ($2,999, includes 550-sheet paper tray)	1 x 250, 1 x 500 (standard) 1 x 1,000 with 50-sheet multiposition stapling and 3/4-hole punch ($2,999, includes 550-sheet paper tray)	1 x 250, 1 x 500 (standard) 1 x 1,000 with 50-sheet multiposition stapling and 3/4-hole punch ($2,999, includes 550-sheet paper tray)
Monthly duty cycle	150,000 pages	150,000 pages	150,000 pages
Warranty	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head	1 year (on site) 5 years limited on LED print-head
Year introduced	2005	2005	2005
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Model	*Xerox Phaser 7760DN* EDITOR'S CHOICE 2007	*Xerox Phaser 7760DX* EDITOR'S CHOICE 2007	*Xerox Phaser 7760GX* EDITOR'S CHOICE 2007
List price	None	None	None
Street price (October 2006)	$6,299	$7,699	$7,399
Full-color print engine speed (pages per minute)	35ppm	35ppm	35ppm
Black-only print engine speed (pages per minute)	45ppm	45ppm	45ppm
First page out	*Black:* 6 seconds *Color:* 9 seconds	*Black:* 6 seconds *Color:* 9 seconds	*Black:* 6 seconds *Color:* 9 seconds
Printing technology	Laser	Laser	Laser
Engine manufacturer	Xerox	Xerox	Xerox
Maximum resolution	1,200dpi	1,200dpi	1,200dpi
Processor	800MHz	800MHz	800MHz
Standard memory	512MB	512MB	512MB
Maximum memory	1GB	1GB	1GB
Hard drive	40GB (standard)	40GB (standard)	40GB (standard)
PostScript	PostScript 3 (standard)	PostScript 3 (standard)	PostScript 3 (standard)
Ethernet	Standard	Standard	Standard
Wireless	IEEE 802.11b (optional)	IEEE 802.11b (optional)	IEEE 802.11b (optional)
USB interface	Standard	Standard	Standard
Integrated copy function	No	No	No
Standard paper supply	1 x 500	1 x 500	1 x 500, 1 x 1,500
Optional paper supply	3 x 500 ($999 Web) 1 x 2,500 ($1,249 Web)	3 x 500 ($999 Web)	No
Bypass	1 x 150	1 x 150	1 x 150
11" x 17" paper	Yes	Yes	Yes
110 lb. index	Yes	Yes	Yes
Automatic duplex	Standard	Standard	Standard
Output devices	1 x 400 (standard) 1 x 3,500 with stapling and 3-hole punch ($1,999 street) 1 x 2,500 with stapling, 3-hole-punch, and booklet maker ($2,999)	1 x 400 (standard) 1 x 3,500 with stapling and 3-hole punch ($1,999 street) 1 x 2,500 with stapling, 3-hole-punch, and booklet maker ($2,999)	1 x 400 (standard) 1 x 3,500 with stapling and 3-hole punch ($1,999 street) 1 x 2,500 with stapling, 3-hole-punch, and booklet maker ($2,999)
Monthly duty cycle	150,000 pages	150,000 pages	150,000 pages
Warranty	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee	1 year (on site) + Total Satisfaction Guarantee
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Better Buys for Business

The Business Ink Jet Printer Guide

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EDITOR'S CHOICE AWARDS

From the nation's leading independent authority on office equipment

About the Award

What is an Editor's Choice Award?

This award signifies the best values in each product category, as determined independently by our expert editorial staff.

How often are awards given?

Our Editor's Choice ratings are awarded once per year with each updated guide.

What are the selection criteria?

In each Better Buys guide, we evaluate models from all major manufacturers. Machines are rigorously analyzed to determine (1) the strength of their features and specifications and (2) how they stack up against competitors. Our independent Editor's Choice Awards go to those models that we believe will deliver the highest levels of performance and offer the greatest value for consumers in a given price range.

Where can I find information about each brand and model?

The page references at the right show where to turn for write-ups in the Vendor & Product Profiles section. For example, "Hewlett-Packard Officejet Pro K550 family — page 129" means that the product profile appears on page 129.

Better Buys for Business EDITOR'S CHOICE 2007

Editor's Choice Award Winners

BUSINESS INK JET PRINTER GUIDE

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EDITOR'S CHOICE 2007

Look for the Editor's Choice emblem inside the guide.

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Vendor & Product Profiles

This section provides an overview on each vendor (complete with contact details) followed by analysis on each model offered for sale in the business ink jet printer market. General information about the market, including discussions of technology as well as advice on how to buy a business ink jet printer, follows this section.

EPSON

Long Beach, CA
569 981 3840
www.epson.com

Vendor Profile

Epson America is a division of Japan-based Seiko-Epson Corporation, a manufacturer and supplier of imaging products, semiconductors, liquid crystal displays, and watches.

The company has been an innovative designer of ink jet printers and sells an extensive line of them, most of which are geared to home and school use (and therefore not in the scope of this volume).

Epson is the inventor of a technology called piezoelectric ink jet printing. Unlike other companies that have thermal technology for placing ink, Epson's technology is based on changing the shape of a crystal, embedded in the ink jet nozzles, by means of an electrical signal. The shape change causes the ink to be squirted onto the paper. Epson has perfected this technique and is using it to create context-sensitive dot sizes, which allow for added image control and ink savings. The technology can now deliver the smallest ink dots on the market. It has also refined its ink technology (called DuraBrite inks) so it's now water- and light-resistant, an important factor in competing with laser output.

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Product Profile

Epson Stylus C88+
Up to 14ppm full color (320 x 160dpi, draft mode)
Up to 23ppm black & white (320 x 160dpi, draft mode)

Sum-up: Good printer with high-quality inks and a very low price.

This $80 Epson model can be only marginally defined as a business-class printer. We are unable to provide specifications for its speed when printing in normal mode, partly because Epson does not specify that speed and also because this model lacks the standard 600dpi resolution other companies offer.

Pros: Available external Ethernet server, available IEEE 802.11b wireless Ethernet, waterproof light-resistant inks, and low price.

Cons: Minimal paper handling (120 sheets input, 30 output), lack of speed rating for normal resolution, no PostScript or PCL.

Hewlett-Packard

Santa Clara, CA
800 752 0900
www.hp.com

Vendor Profile

In addition to being a leader in laser printing, Hewlett-Packard (HP) is also the dominant market force in ink jet printing. It offers a dizzying array of models and has

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become the vendor of choice. In printing, HP still reigns supreme.

HP sells a confusing variety of choices in the business-class ink jet market, an area where it is now the only serious player. Some of the current models seem to have very similar specifications, though they are based on somewhat different architectures. All of these printers have at least PCL capability, something many competitors do not offer. HP claims to own over 85 percent of the business ink jet market.

HP's Officejet Pro line is radically changing the color printing market on the low end, even on the laser side. The line is a superior buy, and the innovative technology it uses is only in its infancy.

Product Profiles

Hewlett-Packard Business Inkjet 2800
Hewlett-Packard Business Inkjet 2800dt
Hewlett-Packard Business Inkjet 2800dtn
Up to 5ppm full color (600dpi, normal mode)
Up to 5ppm black & white (600dpi, normal mode)

Sum-up: High-end business ledger-size printer with PostScript and other productivity features.

This family of ledger-size printers has the most expensive models in the Business Inkjet line. The Business Inkjet 2800dt costs $749, while the dtn model costs $999. HP does not list a price for the base-level 2800 version. The big selling point is PostScript and PCL. Networking, duplexing, and 400-sheet total capacity are available as well, all standard on the dtn model. There's lots of memory available (up to 544MB). The monthly duty cycle is rated at 12,000 pages, very good for an ink jet.

Pros: PostScript, Ethernet, duplexing, ledger-size printing, 400-sheet capacity.

Cons: More expensive than many faster color laser printers.

Hewlett-Packard Officejet Pro K850
Hewlett-Packard Officejet Pro K850dn
Up to 6ppm full color ("laser quality" mode)
Up to 7ppm black & white ("laser quality" mode)

EDITOR'S CHOICE 2007

Sum-up: A ledger-size printer with a revolutionary technology.

The Officejet Pro K850 family is slower and more expensive than the K550 model, but has one key advantage, the ability to print ledger-size pages. Otherwise, these printers use the same innovative technology involving large integrated arrays of color printheads built into a single chip that allow them to print with minimum side-to-side movement.

The "laser quality" speeds that HP gives are 7ppm in black and 6ppm in color. Resolution appears to be the equivalent of 1,200dpi printing. Speeds are not as fast as the Officejet Pro K550, but they're not bad.

There are two models in this family:

- The Officejet Pro K850 ($399) comes with a USB port, and has optional duplexing and Ethernet.
- The Officejet Pro K850dn ($499) adds standard duplexing and Ethernet.

Both models have a 256MHz processor and are rated for a duty cycle of up to 6,250 pages per month. 32MB of memory is included. PCL is supported as well as Mac OS X and Linux host-based printing.

The design is quite simple and compact for a ledger-size printer. A low profile makes them easy printers to use on a desktop.

The paper supply is a simple 150-sheet input tray, with 10-sheet manual feed. This printer can handle up to 13" x 19" paper. These models have a photo mode for printing color photos. There's also a single-page feed for specialty papers. (This feature is only available if you don't have a duplexing unit installed.) The output tray holds 100 sheets.

HP gives you a choice of high- and low-capacity cartridges. The cost per page is estimated at a very respectable 2.2¢ in black and a very good 8.4¢ in color. The ink cartridges are easy to install, unlike most older ink jet models.

These models are very good ledger-size printers. They're not quite as special as the models in the Officejet Pro K550 series, but they are the best entry-level ledger-size printers around and are surpassingly affordable both to buy and to operate. At last, ink jet printers can really compete with the laser models.

Pros: Ledger-size printing with a low cost per page.

Cons: Low paper capacity.

Hewlett-Packard Deskjet 9800
Hewlett-Packard Deskjet 9800d
Up to 6ppm full color (600dpi, normal mode)
Up to 8ppm black & white (600dpi, normal mode)

Sum-up: Affordable ledger model with slow speeds and low capacity.

If you need an ink jet capable of printing at ledger size, these models offer an array of features. The Deskjet 9800

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sells for $299, while the Deskjet 9800d sells for $399. They can print on pages up to 13" x 19". However, they print slowly and hold little paper. The 9800d comes with automatic duplexing standard.

Pros: PCL, poster printing.

Cons: Meager paper handling (150 sheets input, 50 output), slow speed.

Hewlett-Packard Deskjet 6940
Hewlett-Packard Deskjet 6940dt
Up to 6ppm full color (600dpi, normal mode)
Up to 10ppm black & white (600dpi, normal mode)

Sum-up: Good paper input and decent speed for a low price.

The Deskjet 6940 is priced at $130, while the Deskjet 6940dt comes in at $180. These new models (upgrades of the discontinued Deskjet 6840 and 6840dt models) have some good features for the price: up to 400 sheets of input (standard on the dt model), duplex (also standard on the dt model) and standard Ethernet. This family's claim to fame is its standard built-in support for the wireless protocol IEEE 802.11g. That's a faster version of the now-common IEEE 802.11b protocol. Of course, you'll be limited to IEEE 802.11b speeds unless you have a sending device that offers the newer protocol. Also, the printer design is elegant and compact.

Pros: Ethernet and IEEE 802.11g standard, automatic duplexing optional, decent 400-sheet capacity.

Cons: 50 sheets of output capacity.

Hewlett-Packard Deskjet 6540
Hewlett-Packard Deskjet 6540dt
Up to 6ppm full color (600dpi, normal mode)
Up to 10ppm black & white (600dpi, normal mode)

Sum-up: Inexpensive models with pretty good features.

These models, the $130 Deskjet 6540 and the $180 Deskjet 6540dt, are similar to other HP models at this level. They have decent enough features and can be shared among a few users.

Pros: PCL 3 standard, Ethernet and 802.11b optional, automatic duplexing (standard on the dt model), and a decent 400-sheet capacity (also standard on the dt model).

Cons: Slow at normal speeds, only 50 sheets of output capacity.

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Hewlett-Packard Business Inkjet 1200d
Hewlett-Packard Business Inkjet 1200dn
Hewlett-Packard Business Inkjet 1200dtn
Hewlett-Packard Business Inkjet 1200dtwn
Up to 8ppm full color (600dpi, normal mode)
Up to 9ppm black & white (600dpi, normal mode)

Sum-up: Inexpensive machines with some interesting features.

This family is priced from $200 to $350. A full range of networking is available, and auto-duplexing is standard for all models.

Pros: External Ethernet server option (standard on three models), wireless connectivity, automatic duplex standard, 400-sheet capacity.

Cons: No PostScript.

Hewlett-Packard Business Inkjet 2300
Hewlett-Packard Business Inkjet 2300n
Hewlett-Packard Business Inkjet 2300dtn
Up to 8ppm full color (600dpi, normal mode)
Up to 9ppm black & white (600dpi, normal mode)

Sum-up: These models have good paper capacity and a strong duty cycle.

Priced from $499 to $899, these are capable models with (for ink jets) decent paper capacity and speed along with good features. But they are not inexpensive.

Pros: Ethernet (optional on Business Inkjet 2300), adequate memory (up to 320MB), good maximum paper capacity (900 sheets), duplexing, PCL, and PostScript.

Cons: Purchase prices comparable to color laser printers.

Hewlett-Packard Officejet Pro K550
Hewlett-Packard Officejet Pro K550dtn
Hewlett-Packard Officejet Pro K550dtwn
Up to 10ppm full color ("laser quality" mode)
Up to 15ppm black & white ("laser quality" mode)

Sum-up: A revolution in office printing.

The Officejet Pro K550 family is a winner. It combines real-life speed with features good enough to surpass those of many of the bargain color laser printers in this guide, and at markedly lower prices. Even better, it has consumables costs that are remarkably low for an entry-level office printer. Frankly, it makes almost all of HP's business ink jet line that we have documented above irrelevant.

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These machines print at 10ppm in what HP calls "laser quality" color, which would appear to be at 1,200dpi. HP has come up with a technique involving large arrays of color printheads built into a single chip that allows these printers to print quickly with minimum movement from side to side.

There are three models in this family:

- The Officejet Pro K550 ($199) comes with a 250-sheet input tray, a USB port, and optional duplexing.
- The Officejet Pro K550dtn ($299) adds an extra 350-sheet tray, standard duplexing, and Ethernet.
- The Officejet Pro K550dtwn ($349) adds a Wi-Fi connection.

All three models have a decent 300MHz processor and are rated for a duty cycle of up to 7,500 pages per month. 32MB of memory is included. PCL is supported as well as Mac OS X or Linux host-based printing.

The design is elegant and compact. The ink cartridges are easy to pop in and out, a big improvement over many earlier designs. The paper path is very simple, so paper jams are no problem. Even better, this machine is very quiet. Between its quiet operation and its compact size, this is a nice machine that can reside comfortably on someone's desk (not the case with most low-end color laser printers).

There are two input trays, a 250-sheet tray and a 350-sheet tray (standard on all but the base model). Output maxes out at 150 sheets.

While this is a solid office printer, it also has a photo mode for printing color photos. Photo printing is slower, but not as painfully slow as with some other inkjets.

HP has developed high-capacity cartridges for these models. That's a big plus over most ink jet printers. The high-capacity black cartridge will run for up to 2,350 pages, and the color cartridges can yield up to 1,200 pages. Better yet, HP indicates the price of a color page is around 7.7¢ per page, far below those of similar laser printers. The black cost per page is stated to be as low as 1.5¢.

Be aware that this is an ink jet printer. This means that unlike a laser printer, it will slow down as the pages get more complex and more ink gets laid down. But on normal office documents, the speed does very well against comparable laser models.

What's remarkable about this series is that it is only the first version of this technology. We know HP plans to build on it, both in terms of speed and features. The technology will doubtless disrupt the low-end color laser market; what will be interesting to see is whether it can reshape the larger workgroup market as well.

Pros: Everything, including price, design, running costs, and features.

Cons: None really, unless you need PostScript.

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Industry Briefing

Introduction

Traditionally, manufacturers of ink jet printers have focused on the small-office/home-office (SOHO) market. These low-cost machines feature speeds, operating costs, connectivity features, and duty cycles appropriate for low-volume users, making them less suitable for users in demanding workgroup environments. For the most part, users in workgroups have had to buy a laser machine to handle their color printing needs.

A few years ago, however, the market saw the birth of a new, more upscale kind of ink jet printer. This class of machine was designed to help bridge the gap between personal ink jets and lasers. (Henceforth in this section, the term "ink jet" will apply specifically to "liquid" ink jets, not to solid ink jets — see page 61 for a discussion of solid ink jets, which are generally regarded as being "laser-class.")

The ink jet printer market can be divided into a number of different categories. They are:

- ✔ Small-office/home-office models, with prices under $100
- ✔ Ultra-portable models designed for "road warriors"
- ✔ Wide-format printers for printing posters and signs
- ✔ Special mini-printers for 1-up uses including name tags and barcoding
- ✔ Photo-quality printers primarily used for creating glossy pictures on special paper
- ✔ Multifunctionals that offer some combination of printing, copying, scanning, and faxing (we review these in our *Printer Multifunctional Guide* — see back cover for more)
- ✔ Business-class ink jets

Although most ink jet models seem like relatively simple machines, getting both high quality and fast speed out of an ink jet is a serious engineering task. For that reason, there are fewer manufacturers in the ink jet than in the laser market. Only a handful of vendors — Hewlett-Packard, Epson, Lexmark, and Canon, along with Fuji Xerox (which does not sell ink jets in the US) — have honed this technology for the office and continue to improve on it.

In an ink jet printer, images are created just as in dot matrix and laser printers. Each image is comprised of thousands, or even millions, of tiny dots. As technologies have improved, resolutions have gotten higher and image quality has improved dramatically. Speeds have also reached respectable levels.

However, the whole sector of business ink jets faces a very big challenge — the emergence of sub-$500 color laser printers. That challenge is being muted by the emergence of a new, faster ink jet technology from Hewlett-Packard.

Business ink jets defined

It's the business-class ink jets that have made an impact on the color printer market covered by this guide. We consider printers to be "business-class" if they have at least two of the following capabilities:

- ✔ Ethernet compatibility (standard or optional)
- ✔ PostScript support (standard or optional)
- ✔ Duty cycle of 5,000 pages per month or higher

There are other characteristics that are important as well, shared by many of the printers we cover. These include rated speeds (in draft mode, at least) above 14ppm, automatic duplexing, decent paper-input capacity (over 150 sheets), and the availability of PCL printing support. Many of the printers in this guide have one or more of these characteristics as well.

Because of the additional features, business-class machines often cost over $200 and can reach prices of $1,000 or more. They also vary greatly in features. For example, over half of the units do not offer automatic two-sided printing even as an option, something that most color laser printers now include. Stapling, by the way, is not offered by any of the ink jet printers we cover.

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Ink Jet Technology

Vendors have done well in overcoming the two major problems that used to plague ink jet printing: consistency and quality. Older models used to suffer from uneven ink flow, along with clogging of heads from dried ink. They required a lot of maintenance to keep them from producing occasional "accidents" on the page. But major vendors have invested in improved ink chemistry and delivery technology and have engineered more nozzles into a smaller area. The quality and resolution of current ink jets are excellent.

Printheads

The printhead contains a series of nozzles that are used to spray drops of ink. The head is moved from side to side, and the paper is slowly moved forward as each line of ink is laid down. The spacing of the nozzles is the key to the resolution of the printer. At 600dpi resolution, nozzles are spaced every 42.5 micrometers (about 1/600 of an inch), hence 600 nozzles per inch. Typical printheads are from one-third to one-half inch in width, though the newer HP Officejet Pro models are coming out with very wide heads, adding to print speed. In addition, some newer printheads have more than one row of nozzles. Miniaturization is leading to higher resolutions and higher speeds.

Printheads have traditionally had the problem of becoming clogged. This is particularly the case when the printer is not used frequently, leading to ink drying on the nozzles. There are several ways to address this problem, as recommended by your vendor. You can access the heads and clean them (there are commercial solvents for this purpose). You can use a self-cleaning function that more and more ink jets offer (check your printer manual). Or you can replace the printhead or (more likely) the cartridge, which is often integrated with the printhead in office printers, as we discuss below. It should be noted that improvements in engineering have reduced clogging problems considerably.

Ink cartridges

It's important to understand that as far as vendors are concerned, they are in the business of selling ink, not printers. Many ink jet printers are sold at break-even margins (or even at a loss), the better to induce you to get a machine. The real profits are in the cartridges.

Ink cartridges in some older ink jet printers came in three colors (cyan, yellow, and magenta — some even in red, green, and blue). Black areas like type were made from a combination of the three. Current technology involves four colors — black, cyan, yellow, and magenta — just like color laser printers. Note that, depending on the manufacturer and the model, the three color inks may be combined in a single cartridge or sold as independent cartridges, one for each color. The idea is that individual cartridges can save money, since if you run out of, for example, magenta ink, you don't need to toss out the yellow and cyan ink left in the cartridge. You can simply replace the magenta cartridge.

The cartridges of many office ink jet printers include the printhead itself. Since the printhead can wear out or get dirty, replacing it every time you replace the cartridge has the benefit of making the printer easier to maintain. On the other hand, it does seem wasteful to replace a part that potentially could last thousands of pages every time you reload the ink. On some printers, cartridges and printheads are separate consumables.

Cartridges can be refilled, but manufacturers advise against it. That's partly a matter of trying to get you to buy new high-priced cartridges from them (after all, that's where the money is). But it also brings up a very real concern. As ink formulations have been tailored more and more expressly for each vendor's printing technology, replacement inks will not work as well as the manufacturer's own. You may want to experiment with some of the refill solutions, but make sure you test any such scheme thoroughly. Furthermore, because of the integration of ink cartridge and printhead on many models, you may find that the printhead wears out after only a few refills. Furthermore, photographic prints that do not use the manufacturer's own ink will fade far more rapidly. In a home situation, refills might make sense. In a business situation, it may not be advisable.

Printer controls

A CPU (processor) and a small amount of circuitry are built into each printer to control both the mechanical aspects of operation (such as the transport system that moves the printhead and the paper) and the decoding of information sent to the printer from the computer. Most inexpensive ink jet CPUs are not very smart about handling that code: it arrives already encoded as a series of on/off instructions, pre-translated by the computer sending the job (using a technology called GDI in Windows). This approach requires only a relatively basic processor and a small amount of memory. In fact, many vendors don't even state the processor speed or memory capacity on their ink jet models, quite the opposite of the laser printer market.

But many of the business ink jets we cover offer the ability to interpret jobs sent in either PCL or PostScript print languages. This capability requires added memory and more muscle in the processor. The advantage of

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using these printer languages is twofold: it frees up the sending computer faster (you don't have to wait around until the print job is fully interpreted), and it allows you to print more sophisticated jobs, especially those with enhanced graphics capabilities such as large or small type, complex diagrams, and documents created in a page layout program like Quark XPress or Adobe's PageMaker and InDesign. Note that PostScript printing, especially, profits from added memory and processor speed.

Paper

Paper is a very important part of the ink jet printing process, even more than with laser printing. You can, as many do, use regular copy-grade paper for printing. However, you can get better results by upgrading to a paper specifically designed for ink jet printers. Papers vary in two key details: absorbency and reflectance (brightness).

Absorbency is an important factor because of the nature of the ink. As ink is sprayed onto the paper, the best results are produced by a clear, symmetrical dot. If too much ink is absorbed into the paper, the dot will tend to spread out, making a fuzzy dot. This will result in indistinct colors and fuzzy type and line graphics.

To prevent this, you may want to use a specially coated paper. The coating is a thin waxy film that helps keep the ink from being absorbed too much. Most of the vendors sell such paper, especially for use in printing photographs. Because of the clarity and precision of the dots, the printer can lay down an extra set of interpolated dots on each row with no fear that the ink will simply run together. If you need color images to be archived, you should use the manufacturer's photo paper only, since these companies have thoroughly tested the combination of their ink and their paper for color durability.

More important for regular office printing is the reflectance, or brightness, of paper. This is a measure of how much light is reflected from the surface. Rough surfaces (such as on most recycled papers) have low reflectance; that is, they scatter light. Copy paper has medium reflectance. And high-quality papers (sometimes sold as laser printer or ink jet printer paper) have high brightness, reflecting more light back to the reader. Brighter paper means brighter, more vivid printing, both black and in color. Take, for example, the difference between the printing on a newspaper (low reflectance) and a glossy fashion magazine (high reflectance) to see how the same image can look very different when paper is the variable.

Note that ink jet manufacturers also sell their own paper suggested for use with their printers. This may sound like a ploy, and for regular office use it is unnecessary. But for printing photos, you'll get the best results — in terms of color accuracy and color stability — using special paper. As ink jet printers replace standard silver-halide photo prints, that's an important consideration for some users.

Aside from office paper, of course, ink jets can print on many substrates, from labels to transparencies to envelopes. Not all special papers will work well with all ink jet printers. Vendors will be glad to sell you special papers and transparency material appropriate for your printers, but you can also purchase them from third parties.

Speed and resolution

Speeds for ink jet printing have improved dramatically over the past few years. Even so, buyers should be very careful when evaluating speeds, especially when comparing them with their laser-printing alternatives. First, the speed for color laser-class printers has significantly improved over the past few years, so that you can get excellent, fast color lasers at a price unimaginable not long ago. Second, with color lasers, the difference in speed between printing a page with heavy coverage and a page with light coverage is pretty minimal. But with ink jet printers, the more coverage on a page, the slower the printing speed. Because ink on an ink jet printer is being put down line by line, the more blank space, the faster the printing. By contrast, a laser machine has to image the full drum whether it has lots of coverage or very little.

For this reason, we generally state the speed of ink jets as "up to" a certain number of pages per minute (ppm). The rated speed given by the manufacturer is usually based on a low-coverage page. A color page with heavy coverage can take considerably longer. While manufacturers are making more productive engines these days, the fact remains that per-page speeds are less predictable on ink jets than on lasers, especially if the page contains more than 10 to 15 percent ink coverage.

Another factor that affects speeds has to do with resolution levels. Nearly all ink jet printers offer a low-resolution draft mode, a normal mode, and a high-resolution photo mode. Speeds vary widely according to the mode selected. When possible, we use the normal-mode figure in our comparisons, but some vendors don't clarify the distinction between draft and normal. Normal resolution is generally 600dpi, while draft mode is often 300dpi. From our point of view, 600dpi printing is acceptable for office use. 300dpi is not the kind of resolution you'd want to send out of the office.

In theory, this should not be a problem. You can print in draft mode during the composition of any document in draft stage and wait to print at normal resolution when a document is completed and ready to send out. In our

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experience, however, we find that it is hard to get users to select printing modes in a real office situation. You may find it difficult to train users to work this way, and therefore draft mode may rarely get used.

Photo mode is available on most of these printers. Often that means resolution of up to 2,400 x 600dpi or even higher, and this involves some image enhancement software. It is remarkable how ink jet printers can print superb photographic output on the right kind of paper. Be aware, however, that photo mode slows down ink jet printers to a crawl. If you need this capability more than occasionally, you should get one of the dedicated printers that specialize in printing at photo resolution.

The bottom line on ink jet speeds is that a good measure of skepticism is warranted. Ink jets are a lot faster than they used to be, but they're not comparable to color laser printers, even those older models with similar official page-per-minute speeds. If you need 20 prints of the same page and you're in a hurry, or you need to print a 50-page report more than once in a while, ink jets may not be suitable.

The one exception to this rule is Hewlett Packard's Officejet Pro series. These run at high quality in speeds up to 10ppm in color, 12ppm in black-and-white, which is quite respectable.

Connectivity

The three basic types of connectivity on these machines are parallel (the old standard), USB (the current standard), and Ethernet. Hewlett-Packard, in particular, is providing wireless connectivity for an increasing number of units.

Note that Ethernet compatibility is a lot simpler than it used to be. At one point, we made a strong distinction between those printers that had built-in Ethernet (that is, through a card or board inside the computer) and external Ethernet (through an external server). An external server is a device (usually a small box slightly larger than a deck of cards) that connects easily to the Ethernet network and is connected to the printer in turn, using either a parallel cable or a USB connection. The external server has some memory and limited intelligence, allowing it to direct traffic to the printer. This once was considered a second-class solution, but as external servers have improved (adding more processor speed and internal memory for buffering), the gap has narrowed considerably.

As a result, several major vendors now offer external Ethernet server add-ons that are as fast as their internal ones. Hewlett-Packard offers a variety of connectivity options in both laser and ink jet lines, often allowing the user a choice between internal and external connectivity. HP offers external connectivity for some of its lowest-priced and least robust ink jets. As home-office users are starting to set up small Ethernet networks, this trend keeps growing. The upshot is that Ethernet compatibility is growing more common and the distinctions between the different approaches are narrowing.

Wireless

As laptop and handheld computers have grown in use, so has the need for a convenient way of sending print jobs from these devices to peripherals such as printers, copiers, and multifunctionals. Until recently, every time you wanted to print in a new location, you'd have to whip out a cable and attach and configure the new printer — not something you'd want to do to print one or two pages. The ideal solution is transmitting data using wireless technology, so that you don't have to mess with cables. Wireless technology has become common in other aspects of life (take TV remote controls, for example). But until recently, the lack of agreed-on certified standards has slowed its adoption in the printing world. We now have two popular wireless standards, namely Bluetooth and IEEE 802.11 (Wi-Fi). More and more printers are offering interfaces to one or both of these technologies. Hewlett-Packard has been leading the way, offering interface options for both technologies for both ink jet and laser printers (through a variety of servers and hubs). The triumph of wireless has been long proclaimed, but it is now finally reaching critical mass, both from the vendors of computers, handheld personal digital assistants (PDAs) like PalmPilot, and cell phones on one hand and from printer and network suppliers on the other.

Wi-Fi (IEEE 802.11)

Wi-Fi, or IEEE 802.11 (more precisely, IEEE 802.11b or the faster, but compatible, IEEE 802.11g), is a standard for wireless local area networks (WLANs). This defines a full Ethernet connection between devices and gives physically unconnected devices connectivity to the local area network (LAN). In theory it can replace the office cabling entirely, though up-to-date versions of wired Ethernet (Fast Ethernet) are far better suited to heavy network traffic. Wi-Fi signals can go through walls, and these wireless transmissions can extend to a distance of 100 feet or more.

Wi-Fi is generally used to connect a handheld or a laptop to a hub that is in turn connected to a traditional wired Ethernet backbone. In that way, the device can piggyback onto an existing LAN. In order for this to work, both ends of the transaction need a transceiver (transmit-

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ter/receiver). This can be in the form of built-in electronics, an add-on computer card, or an external unit plugged into the device via a USB or some other port. HP has both printers and print servers that can accept 802.11b signals.

Bluetooth

The simplest form of wireless communication uses beams of light in the infrared spectrum to communicate between components. Infrared communications is "line of sight" technology. As you know from channel surfing, you have to point the infrared source at the receiver for it to work.

Bluetooth is becoming the industry-standard infrared technology. Developed by a consortium of vendors, including Siemens, Intel, Toshiba, Motorola, and Ericsson, Bluetooth involves building a very small transceiver into a computer, printer, or other electronic device.

Paper handling & finishing

Ink jet printers are generally limited in both paper-feed capacity and output options. The majority of business-class printers have paper capacities of 250 sheets or less, and a few have options to go beyond 400 sheets. But in general, you'll have to feed the machine regularly if you plan to use it more than casually, and you will rarely have a second drawer for letterhead or any other secondary paper choice.

While most business ink jet printers offer imaging up to legal size (8.5" x 14"), an increasing number offer ledger-size (11" x 17") printing. Also, automatic duplexing is becoming more common as an option.

On the output side, the options are few. As we have stated, duplexing is offered on many of the models in this guide. None of these machines offer stapling, hole punching, or offset stacking. In fact, some units have a scanty 50 to 100 pages of total output, meaning you'll have to get up out of your chair frequently to empty the output tray. That will be good for your health, no doubt, but it is another reason why ink jets and long jobs just don't mix. Along with sustained speed, paper capacity is an area where color laser printers still make ink jet printers look like 98-pound weaklings when it comes to serious office use.

The future of business ink jets

Over the past few years, prices for low-end color laser printers have come down significantly, with several low-cost models coming in at less than $500 and many faster machines coming in at less than $1,000. Given the advantages in real speed and cost per page as well as other features that color laser printers have, these models have encroached significantly on business-class ink jets.

We would be giving up on the business ink jet printers except for the arrival of HP's new Officejet Pro models. These machines are tolerably fast, even at laser printer resolution. They also have costs per page that compete well with all but the lowest cost laser jet printers, under 8¢ per page in color, around 1.5¢ per page in black-and-white. In addition, they are quiet, low-profile machines, in contrast to the bulk of color lasers, making them more suitable for a desktop. These are machines that give business ink jets a real future, and we expect faster models to follow the first introductory models.

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